



# **South Baltimore Gateway Parking Study**

## **Baltimore, Maryland**

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# Introduction

## Parking Study Purpose

This study originated with a recommendation from the South Baltimore Gateway Master Plan. The Plan recommended: “Conduct a parking study for the South Baltimore Peninsula focused on Otterbein, Federal Hill, Riverside, South Baltimore Neighborhood and Sharp-Leadenhall, addressing current needs and impacts of future development.”

The Parking Authority of Baltimore City (PABC) directed the study. PABC serves the City of Baltimore, its residents, businesses and visitors by managing the parking assets of the City and developing and implementing parking and parking-related transportation solutions. PABC has oversight of 17 City-owned garages and 24 City-owned lots. Furthermore, the Parking Authority administers on-street parking programs for the City including parking meters, the City’s Residential Parking Permit (RPP) programs, reserved parking spaces for residents with permanent disabilities, truck loading zones, passenger loading zones, and valet parking zones.

The goals of the study are to provide a clear understanding of the current parking situation in the study area neighborhoods, to have as clear an understanding as possible of the future parking situation in those neighborhoods, and to provide recommendations on strategies for positively affecting the current and future parking situation in the study area neighborhoods.

## Parking Study Boundaries

The parking study includes the area within the following boundaries:

- Northern boundary: W. Conway Street
- Southern boundary: CSX Rail
- Eastern boundary: Inner Harbor from W. Conway Street to Lawrence Street, then Key Highway
- Western boundary: Route 395 from W. Conway Street to Stockholm Street, then CSX Rail

The study area excludes the Spring Garden Station of BGE because it has no pedestrian access from South Baltimore across the CSX freight rail line. The study includes the area between the southern end of the Sharp-Leadenhall neighborhood and the rail line to capture the future Stadium Square development.

## Parking Study Methodology

At the outset of the study, PABC and the Baltimore City Department of Transportation (BCDOT) provided parking-related information on existing facilities, regulations, and enforcement. PABC provided guidance on time periods for which to collect parking data.

A comprehensive inventory of on-street spaces in the study area was conducted. The number of spaces on each block of each street was recorded by regulation: Time limits were recorded for restricted, permit, and metered parking. Rates were recorded for metered parking

An inventory of off-street parking facilities with 10 or more spaces was conducted with information on facility name/location, type (garage or lot), and whether it is a stand-alone facility for public parking, public parking for a commercial site, or private. For off-street facilities that are open to the public, information on number of spaces and daily/monthly cost was obtained. Private residential off-street parking was not included in the inventory. The inventory was performed in October and November of 2016.

Occupancy counts were conducted for all on-street parking and for the off-street parking open to the public during several different time periods.

A turnover study of on-street parking was performed for all streets with metered parking and approximately half of the streets with residential permit parking (RPP), to determine if regulations are performing as intended. Occupancy and turnover data collection occurred in the period from December 2016 through February 2017.

The data from the inventories and occupancy studies was analyzed to determine areas where parking demand often exceeds supply, and the effectiveness of current regulations and enforcement

Current and planned development and other actions and initiatives that will affect travel and parking demand in the future were identified.

Based on the analysis, a series of recommendations is proposed to address current needs and impacts of future development.

## Existing Conditions

### On-Street Parking Regulations

#### Residential Permit Parking

Map 1, the Residential Permit Parking Inventory map, identifies street segments posted with residential permit parking and the number of RPP spaces.

A Residential Permit Parking Area means an area in which resident vehicles displaying a valid permit are exempt from the posted parking time restrictions. Permits and visitor passes are issued and valid for a one-year period from the designated annual renewal date for each specific RPP Area. Residents must re-apply every year.

In each Residential Permit Parking (RPP) Area, qualified residences are eligible by City code for up to four (4) decals per household. Required documentation must be verified before permits are issued. Each permit costs \$20 per year.

The RPP areas located in the Study Area include Areas 8, 9, 19, 30, and 41. All residential permit parking zones are signed as "Tow Away Zone During Stadium Events".

#### **Area 8 (Otterbein)**

Three different RPP hours are posted in RPP Area 8, differing block to block:

- Designation 1: Two Hour Parking 7:00 a.m. - 12 Midnight
- Designation 2: No Hour Parking 7:00 a.m. - 12 Midnight
- Designation 3: One Hour Parking 7:00 a.m. - 12 Midnight

Two visitor passes per household/per year are allowed

#### **Area 9 (Federal Hill)**

The posted regulation in RPP Area 9 provides the following time restrictions for non-permit vehicles:

- Two-hour parking 7:00am to 6:00pm Monday-Saturday; 7:00am to 2:00pm Sunday, and

- No parking 6:00pm to 7:00am Monday-Sunday Morning; 2:00pm to 7:00am Sunday-Monday Morning

One visitor pass per household/per year is allowed in Area 9.

#### **Area 19 (Federal Hill South)**

The posted regulation in RPP Area 19 provides the following time restrictions for non-permit vehicles:

- Two-hour parking 7:00am to 6:00pm Monday-Saturday; 7:00am to 2:00pm Sunday, and
- No parking 6:00pm to 7:00am Monday-Sunday Morning; 2:00pm to 7:00am Sunday-Monday Morning

Two visitor passes per household/per year allowed

#### **Area 30 (South Baltimore East)**

The posted regulation in RPP Area 30 provides the following time restrictions for non-permit vehicles:

- Two-hour parking 7:00am to 6:00pm Monday-Saturday; 7:00am to 2:00pm Sunday, and
- No parking 6:00pm to 7:00am Monday-Sunday Morning; 2:00pm to 7:00am Sunday-Monday Morning

One visitor pass per household/per year allowed

#### **Area 41 (Sharp-Leadenhall)**

No parking is permitted without a permit (24 hours, all days)

Two visitor passes per household/per year allowed

#### **Definition of terms:**

- *Visitor Permit:* A reusable parking pass that allows guests to park in an RPP area while visiting a resident. The visitor pass exempts vehicles who display the pass on their dashboard from posted residential parking restrictions. Issued for temporary use by bona fide visitors of residents of RPP area. All households in an RPP area are eligible to receive one or two visitor permits per year (see area specific details below). Visitor Permits have a large street value for being sold/rented unlawfully. As such PABC does not replace lost permits without an application accompanied by a medical care provider note.
- *Church Permits:* A special permit valid on Sundays from 7:00am to 2:00pm.
- *Permits Sold:* This is the number of permits that have been sold within an RPP area over one year's time. This number accounts for all permits sold, whether currently active or not.
- *Permits Active:* This is the number of permits that are currently active within an RPP area. A permit that has been sold is no longer considered active once an application for a new permit is presented on an address that already has a permit associated with it. The new permit overrides the current permit making it inactive.
  - *Note on Permits Sold and Permits Active.* There are more permits sold in a year than there are permits active. This is due to turnover that occurs as tenants move in and out of rental units and as properties are bought and sold. While the number of Permits Active paints a picture of what permit utilization should look like in an ideal situation, the number of Permits Sold shows the number of permits that are currently in circulation. It is very difficult to enforce penalties for the misuse of a permit that becomes inactive, making it

possible for an individual to continue and use the permit to park in the RPP area until the permit's expiration date. The Parking Authority is working on a software development project to fully share in real time all the active number of permits with BCDOT, so inactive ones won't be honored in RPP areas. This project is large in nature and will switch customers from using physically displayed permits to license plate parking credentials.

*Table 1: RPP area permit sales and active permits:*

Area	Decal Sold	Decal Active	Visitor Sold	Visitor Active	Church Permits
8	594	549	1403	1310	184
9	1314	1146	971	837	139
19	1322	1191	1530	1361	64
30	2491	2243	1593	1381	191
41	30	22	38	31	41

\* Permit Sales 9/1/2015-8/31/2016; Active as of 10/3/2016

*Table 2: Number of spaces available in RPP blocks*

Area	Number of Spaces	Decal Active	Visitor Active	Active Decals/ Number of Spaces	Active Decals Consistent with Available Spaces?
8	<b>639</b>	549	1310	86%	Yes
9	<b>954</b>	1146	837	120%	Yes
19	<b>639</b>	1191	1361	186%	No
30	<b>1251</b>	2243	1381	180%	No
41	<b>52</b>	22	31	42%	Yes

## Stadium Tow Zones

All residential permit parking zones are signed as "Tow Away Zone During Stadium Events". Some street segments did not display Tow Away Zone signs. It is not clear whether this is intended or whether a sign is missing. RPP locations without a Tow Away Zone sign are:

- 900 Block Covington Street, west side, at Federal Hill Park
- 600 Block S. Charles Street, west side
- 400 Block S. Hanover Street, west side
- 500 Block S. Hanover Street, west side
- 100 Block W. Barre Street, north side
- 100 Block W. Henrietta Street, south side
- S. Clarkson Street first block south of Clement Street

In the Sharp-Leadenhall RPP area (41), no parking is allowed except by residential permit holders.

In the Otterbein RPP area (8), the time during which the RPP regulation is in effect is 7 AM – Midnight Monday through Sunday. Given that this time period covers just about any time non-residents would want to park, non-permit holders are virtually always subject to the regulation. The regulation varies within Otterbein. Some streets allow 1-hour or 2-hour parking for non-permit holders; on other streets no parking is allowed except by residential permit holders. Between midnight and 7 AM, anyone could legally park.

In the other residential permit zones (9, 19, 30), parking by non-permit holders is generally only allowed during the day from 7 AM to 6 PM Monday through Saturday and 7 AM to 2 PM on Sunday. Parking is prohibited 6 PM to 7 AM Monday through Saturday, and 2 PM Sunday to 7 AM Monday. Parking is prohibited at the times when stadium events would typically occur.

Violations of stadium parking are easier to detect where parking by non-permit holders is never permitted, or is not permitted during typical event times. In much of Otterbein where some parking by non-residents is legal during stadium event times, enforcement of stadium towing could require patrols at least every two hours.

### Paid Parking

Map 2, the Paid Parking Inventory map, identifies street segments with kiosks or meters. The Paid Parking legend is overlaid on the City's land use map, showing the relation with commercial land uses.

In total, there are 52 street segments with paid parking, located mostly in the central commercial area bound by Henrietta Street, Light Street, Ostend Street, and Charles Street, including the Cross Street Market. Paid parking is also found along the Key Highway and on Covington Street. These locations provide the easiest access to local businesses and tourist venues. Paid parking is also found on Charles Street at the University Specialty Hospital and Royal Sonesta Harbor Court Hotel.

Kiosks are used on 33 street segments focused mostly around Cross Street Market and the north section of Key Highway, and the remaining 19 segments use individual meter parking.

The maximum time limit posted at the meter or kiosk is shown on Map 3. The most common maximum time is three hours. A 3-hour time limit applies to half of all the paid parking spaces. The time limits and number of spaces with each time limit is shown in the Table 3 below.

*Table 3: Maximum time limits of paid parking*

Maximum Time	Number of Spaces	% of Total Paid Spaces
1-Hour	5	1%
2-Hour	29	6%
3-Hour	250	49%
4-Hour	56	11%
10.Hour	159	31%
No limit posted	14	2%
ALL	513	100%

The 1-hour spaces are located along W. Henrietta Street. The 10-hour spaces are located along Covington Street and Key Highway east of Covington Street.

The paid parking regulation is commonly in effect from 10 AM to 8 PM. Some blocks begin as early as 7 AM and other blocks end as late as 10 PM. Paid parking is in effect 24 hours on these streets:

- Light Street in front of Royal Sonesta Harbor Court Hotel (4-hour time limit)
- Key Highway south side between Light Street and William Street (4-hour time limit)
- Covington Street between Key Highway and Grindall Street (10-hour time limit)

The cost for paid parking varies from \$0.50 per hour to \$2.00 per hour, depending on location. Cost can also vary depending on time of day. The cost per hour in the central commercial area is commonly \$1.50 between 10 AM and 5 PM and \$2.00 per hour between 5 PM and 8 PM.

Three segments in the central commercial area that might be expected to have paid parking are currently unrestricted, i.e. have no “Pay to Park” signs or kiosks:

- Charles Street west side opposite Cross Street Market
- Light Street west side between Poultney and Cross Streets
- Ostend Street south side east of Marshall Street to the alley

### Time Limited Free Parking

The majority of streets in Federal Hill, South Baltimore, and northwestern Riverside are posted with a time limit on parking. All but a very few segments have a time limit of two hours. Map 4 illustrates the locations and time limits for free parking. Vehicles with residential permits are exempt from the time limits.

A number of locations are posted with parking time limits of 20 minutes or less. These locations are illustrated on Map 4 and generally for passenger loading. The sign message specifically states “Passenger Loading” at some but not all of the very short time limit parking locations.

### Handicapped

Map 5 identifies street segments having public handicap parking spaces or residential handicap reserved parking spaces. Most public handicap parking spaces are paid handicap parking spaces located on or near South Charles Street and Key Highway. The 900 and 1000 blocks of S. Charles Street have newly installed public handicap parking meters that were not yet in use at the time of the parking counts. Each covered handicap parking meter had a sign displaying “No parking, violators will be towed.” During the turnover counts for the central business district, there were several instances where vehicles were parked illegally in those locations for no more than an hour at a time.

It was observed that almost all of the residential handicap reserved parking permits are issued in South Baltimore and Riverside. Otterbein has no residential handicap reserved spaces.

All residential handicap reserved parking spaces were being used as authorized during the study observations, i.e. by the owner of the appropriate handicap permit pass.

### Truck Loading

Map 6 identifies truck loading zones, the number of spaces, and the days of the week in effect. Most truck loading zones are posted for hours from 8 am – 6 pm, after which parking can occur. The loading zones around Cross Street Market are in effect from 7 AM to noon.

### Special Use

Map 7, the Special Use inventory map, identifies segments with Cab, Valet, and ZipCar parking only.

Cab stands are located on only two segments, in areas of high pedestrian traffic near the Inner Harbor and Cross Street Market. An additional cab stand location could be considered for the Southside Marketplace area.

Valet parking is provided on two segments for small businesses/restaurants on Light Street, and were in use during the weeknight occupancy counts.

There are currently five ZipCar locations:

- Hamburg and Hanover Street
- Ostend and Light Street
- Randall Street and Johnson Street
- Marshall Street and Wells Street.
- Light Street east side south of Lee Street

ZipCar locations changed during the course of the parking study field inventory and counts; a station at Cross and Light Streets was removed and the Light Street and Marshall Street stations were added.

Most ZipCar spaces were found to be vacant during the evening occupancy counts, meaning the ZipCars are being used.

### Private Parking

The Parking Authority issues permits for private permit parking. These locations have signs posted with the permit number. There are only two locations posted with permit numbers:

- Light Street east side south of Conway Street – Parking for Permit Holders Displaying Permit #'s Li0450 – Li0451. This is used for the Baltimore Trolley.
- 1100 block Leadenhall Street – Parking for Permit Holders Displaying Permit #'s LH 11-001 thru LH 11-002. This is used for Baltimore Station, a veteran's social service agency. This parking will be expanded through an ordinance.

Other locations have signs that refer to permit, designated or private parking. Montgomery Avenue west of Light Street and Ostend Street west of S. Charles Street have areas posted with signs with message "Fire Department Personnel Only".

Several residential streets are posted with signs stating "Private Property – Unauthorized and non-permitted vehicles will be towed at owner's risk and expense". These streets are on the City's street centerline file. It is not clear whether the street is in fact private. An example is the 1300 block of Belt Street at the Federal Place II townhome development.

Map 8 illustrates the locations of private on-street parking and their uses.

### Unrestricted Parking

Map 9 shows street segments that have unrestricted parking on all or part of the segment.

Due to the method of mapping, if there is any unrestricted parking on a segment it is shown for the entire segment. Some of this unrestricted parking is in the Truck Loading zones at night. Some unrestricted parking occurs on a regulated block, such as RPP. Due the sign placement and message (arrow direction, etc.) and absence of a "No Parking" sign, spaces were recorded as Unrestricted and in fact people park there.

The majority of streets that have no regulations (other than residential handicap reserved spaces) are found in Riverside south of Fort Avenue.

## On-Street Parking Conditions

### On-Street Parking Occupancy

Counts of parked vehicles were conducted during the weekday between 11:00 AM and 1:00 PM in the central commercial area bound by Henrietta Street, Light Street, Ostend Street and Charles Street. The weekday mid-day occupancy of on-street spaces is illustrated in Map 10.

Counts of parked vehicles were conducted on all study area street segments on a weekday evening between 6:00 pm and 8:00 pm, a Saturday evening between 6:00pm and 8:00 pm, and Saturday night from 9:00 – 11:00 pm. The occupancy of on-street spaces during these three periods is illustrated in Maps 11, 12 and 13.

During the weekday evening occupancy and turnover counts for the paid parking segments, it was found that the 100 Block of W. Henrietta Street and the 800 Block of Leadenhall Street (at Shofer's Furniture), as well as the 900 Block of Covington Street (at Federal Hill Park) saw limited use. Specifically, Covington Street with 89 total paid parking spaces that are free with a residential permit had only 7 vehicles parked. Hour to hour on this segment, approximately 15 spaces were used in total.

The total occupied spaces by neighborhood compared with the number of spaces available from the field inventory is shown in Table 4.

*Table 4: On-street parking occupancy by neighborhood*

Neighborhood	Number of Spaces	Occupancy - Neighborhood		
		Weekday Evening	Sat Evening	Sat Night
Otterbein	542	402	452	472
Federal Hill	1681	1484	1644	1724
Riverside	3017	3099	3187	3280
South Baltimore	1315	1474	1453	1496
Sharp-Leadenhall	440	239	299	299

Neighborhood	Overall Percent Occupancy - Neighborhood		
	Weekday Evening	Sat Evening	Sat Night
Otterbein	74%	83%	87%
Federal Hill	88%	98%	103%
Riverside	103%	106%	109%
South Baltimore	112%	110%	114%
Sharp-Leadenhall	54%	68%	68%

The residential permit areas do not have the same boundaries as the neighborhoods.

- Zone 8 includes some blocks in Sharp-Leadenhall.
- Zone 30 includes some blocks in Federal Hill
- Zone 19 is all within the Riverside neighborhood but only a small portion
- Zone 41 is all within the Sharp-Leadenhall neighborhood but only a small portion.
- Most of Riverside and Sharp Leadenhall are not RPP.

The occupancy data for the residential permit areas is illustrated in Table 5.



Table 5: On-street parking occupancy by permit zone

Permit Zone	Number of Spaces in RPP Blocks	Occupancy - RPP Blocks		
		Weekday Evening	Sat Evening	Sat Night
8 - Otterbein	524	437	474	492
9 – Federal Hill	825	745	832	875
19 – S. Federal Hill	639	694	701	708
30 – South Baltimore	1251	1381	1354	1395
41 – Sharp-Leadenhall	52	26	28	30

Permit Zone	Overall Percent Occupancy - RPP Zone		
	Weekday Evening	Sat Evening	Sat Night
8 - Otterbein	83%	90%	94%
9 – Federal Hill	90%	101%	106%
19 – S. Federal Hill	109%	110%	111%
30 – South Baltimore	110%	108%	112%
41 – Sharp-Leadenhall	50%	54%	58%

Finally, since all of RPP Zone 19 is in Riverside, a comparison can be made between areas with and without RPP.

Table 6: Riverside neighborhood - comparison of RPP Area 19 and area without RPP

#### Available Spaces and Occupancy

Spaces		Weekday Evening		Saturday Evening		Saturday Night	
Permit 19	No permit	Permit 19	No permit	Permit 19	No permit	Permit 19	No permit
639	2378	694	2405	701	2486	708	2572

#### Overall Percent Occupancy

Weekday Evening		Saturday Evening		Saturday Night	
Permit 19	No permit	Permit 19	No permit	Permit 19	No permit
109%	101%	110%	105%	111%	108%

Riverside includes Key Highway, which has very little parking except between Jackson Street and Webster Street. If Key Highway is excluded from the “No permit” numbers, the “No permit” occupancy increases by 2%.

There is little difference between the overall percent occupancy of RPP vs. non-RPP areas. This comparison indicates that RPP alone is not sufficient to address parking issues; other actions will also be needed.

Vehicle owners left their vehicles for longer periods of time on unregulated and residential permit parking segments when compared to paid parking areas. In general, paid parking was being used significantly less throughout the day when compared to unregulated or time limited free spaces. However later in the evenings when segments no longer required fees (after 6PM or 8PM) a majority of the paid segments were almost completely occupied.

The neighborhood business district was consistently at maximum occupancy for both mid-day and evening counts.

### On-Street Parking Occupancy during Events

Additional occupancy counts were conducted during two different Orioles baseball series to determine whether there is a significant difference from regular peak periods during events. Event counts were conducted in Otterbein, Federal Hill, Sharp-Leadenhall and the northern portion of Riverside (Gittings Street and north, Jackson Street and west). The opponents were the Toronto Blue Jays (May 19-20, 2017) and the Boston Red Sox (June 1 – 3, 2017).

*Table 7: On-street parking occupancy during events*

Neighborhood	Number of Spaces	Occupancy - Neighborhood				
		GAME Blue Jays	GAME Red Sox	Evening	Sat Evening	Sat Night
Federal Hill	1681	1566	1609	1484	1644	1724
Otterbein	542	475	464	402	452	472
northern Riverside *	639	729	720	668	689	712
Sharp Leadenhall	440	285	346	239	299	299

Neighborhood	Overall Percent Occupancy - Neighborhood				
	GAME Blue Jays	GAME Red Sox	Evening	Sat Evening	Sat Night
Federal Hill	93%	96%	88%	98%	103%
Otterbein	88%	86%	74%	83%	87%
northern Riverside *	114%	113%	105%	108%	111%
Sharp Leadenhall	65%	79%	54%	68%	68%

\* northern Riverside is the portion from Gittings Street north and from Jackson Street west

The overall parking occupancy during events was similar to the occupancy on a Saturday night without an event. Compared with Saturday night, 70% of the street segments had the same number or fewer cars parked during the event, and 22% of the segments had one or two more parked cars during the event. The largest number of additional parked vehicles during events compared with the regular evening periods surveyed occurred on:

- The 200 – 400 blocks of Key Highway, between William Street and Covington Street. These spaces are metered until 8 pm on all days, with a 4-hour time limit at \$2.00 per hour.
- The 1100 and 1200 blocks of Sharp Street, between Ostend Street and the northern end of Sharp Street at the Sharp-Leadenhall Elementary School. These spaces are unrestricted.

There were 84 more cars parked within the entire count area during the Red Sox game observations than during the Blue Jays game observations. The majority of the difference was parked in Sharp-Leadenhall with the remainder in Federal Hill.

### Paid Parking Turnover

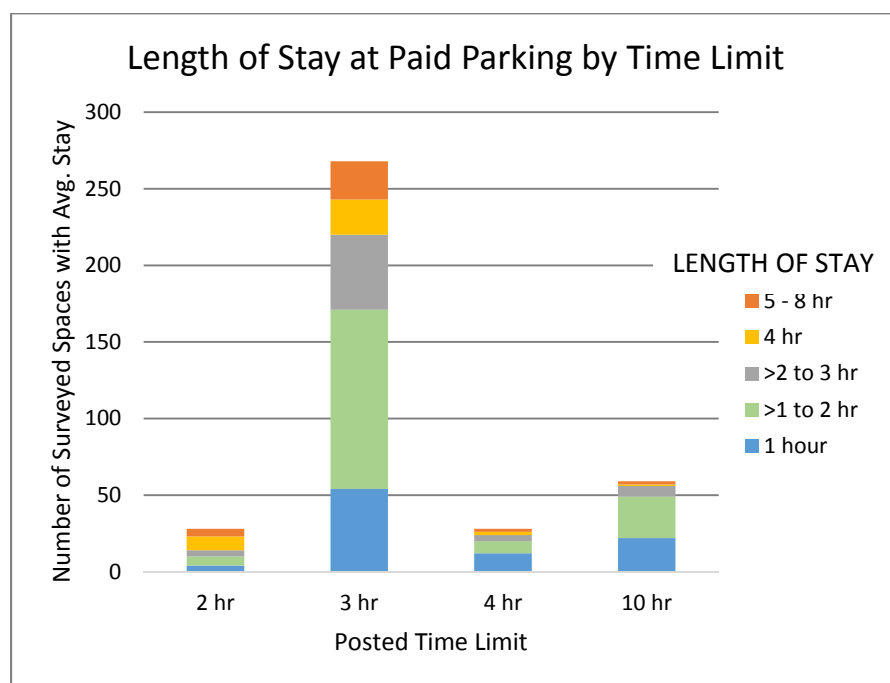
A turnover study was conducted of all Paid parking spaces on a weekday. License plate numbers were recorded hourly for eight hours starting at 1:00 PM. The total number of individual license plates recorded during the eight-hour period on each street segment was divided by the number of parking spaces on the segment to arrive at the turnover, or number of vehicles per space. Paid parking turnover is illustrated in Map 14 and summarized in Table 8. Much of the very low turnover of <0.5 occurs in 10-hour zones on Covington Street and Key Highway.

*Table 8: Paid parking turnover*

Turnover (Vehicles/Space)	# Spaces	% Spaces
<0.5	164	32%
0.5 -0.9	36	7%
1 - 1.9	119	23%
2 - 2.9	134	26%
≥ 3	60	12%
Total paid spaces	513	100%

The hourly observations allowed a calculation of the duration of stay. The average duration of stay was calculated for each parking space that was occupied during at least one observation. Figure 5 shows the average stay for all spaces within each maximum time regulation.

Figure 1: Length of stay at paid parking spaces



## Paid Parking Violations and Enforcement

The payment status for each vehicle was recorded during the turnover study by checking the meter or the payment receipt on the dashboard. If the status was unpaid and the vehicle had a Handicapped license or hangtag, it was recorded as HC. Vehicles with parking tickets issued by BCDOT enforcement were noted.

761 individual license plates were recorded over the 8-hour period in the Paid parking segments. There were 254 individual vehicles in violation over the 8-hour period, many for several hours. Most of the violations were for non-payment but there were some vehicles parked in illegal locations and some vehicles stayed over the maximum time limit. In locations with Pay to Park kiosks, many vehicles that did pay stayed longer than the time that they had paid for. It was noted that some people park in paid segments for a short period of time up to 30 minutes without paying to run into local businesses. It was also frequently observed that vehicles displayed a payment receipt but it was for a different date. A higher percentage of vehicles seemed to pay at individual meter parking, whereas more vehicles seem to be unpaid when there is a single kiosk on the segment. Of the 254 vehicles in violation, 20 were HC that did not pay; these vehicles stayed most of the study period or all eight hours.

During this study, the public HC meter on the 600 block of Light Street had tape over the blinker so that enforcement officers couldn't see it blinking if they drove by. The same vehicle remained parked in this space all eight hours.

Parking tickets were observed on 17 vehicles of the 254 in violation. Parking tickets were only observed on vehicles towards the end of the turnover count data (around 8PM) in paid parking segments.

The percent of vehicles in paid parking areas that were in violation of payment, time limit or both is shown on Map 15.

## Residential Permit Parking Violations and Enforcement

Approximately half the street segments in each of the five RPP areas were surveyed hourly on a weekday from 1:00 pm to 8:00 pm on a weekday to determine turnover, numbers of violations of the posted regulation, and parking tickets issued to violators.

Locations of residential permit parking violations are illustrated on Map 16. Rarely, if at all, were parking regulations observed to be enforced with tickets.

Otterbein was the only area in which ticketed vehicles were observed. All of the tickets were issued on streets where no parking is ever allowed without a permit. This enforcement is easier since any vehicle without a permit can immediately be ticketed. Violations of 1 hour or 2-hour time limits were not ticketed. These violations require the enforcement officer to make repeated observations.

### Area 8 – Otterbein

Most blocks in Area 8 are posted for permit-parking-only from 7:00 am to midnight. 1-hour or 2-hour parking for non-permit holders is allowed from 7:00 am to midnight on seven out of the 41 street segments in the area, comprising 15% of the 524 total available spaces.

The turnover survey included permit-only blocks and both 1-hour and 2-hour time-limited blocks. Time-limited parking was allowed the entire survey period.

The sample area included 328 spaces. 400 individual vehicles parked, of which 88% had a permit (62% resident, 27% other). The average turnover was 1.22 vehicles/space.

Of the 400 vehicles parking during the eight-hour survey period, only 15 were in violation and 6 of those received tickets. All the tickets issued were in RPP-only areas. On streets with time-limited parking, no violations of time limits were ticketed.

### Area 9 – Federal Hill

Area 9 allows 2-hour parking for non-permit holders 7:00am to 6:00pm Monday-Saturday and 7:00am to 2:00pm Sunday. Other times are RPP parking only. The survey period was on a weekday and included three observations after 6:00 pm when parking is legal only with an Area 9 permit.

The sample area included 336 spaces. 616 individual vehicles parked, of which 85% had a permit (75% resident, 10% other). The average turnover was 1.82 vehicles/space.

58 non-permit vehicles violated regulations, including 41 that were parked after 6pm. 40% of the vehicles in violation remained parked for five or more hours. No tickets were issued.

### Area 19 – Federal Hill South

Area 19 has the same RPP regulations as Area 9, i.e. 2-hour parking for non-permit holders is allowed 7:00am to 6:00pm Monday-Saturday and 7:00 am to 2:00 pm Sunday. Other times are RPP parking only. The survey period included three observations after 6:00pm when parking is legal only with an Area 19 permit.

The sample included 300 spaces. 442 individual vehicles parked, of which 90% had a permit (69% resident, 21% other). The turnover rate was 1.47 vehicles/space.

Of the 46 parked vehicles that did not have a permit, 23 or half were in violation of regulations, including 13 that were parked after 6:00 pm. No tickets were issued.

### Area 30 – South Baltimore

Area 30 has the same RPP regulations as Areas 9 and 19: 2-hour parking 7:00am to 6:00pm Monday-Saturday; 7:00am to 2:00pm Sunday. Other times are RPP parking only. The survey period included two observations after 6:00pm when parking is legal only with an Area 30 permit.

The sample included 658 spaces. 995 individual vehicles parked, of which 85% had a permit (71% resident, 14% other). The turnover rate was 1.51 vehicles/space.

46 vehicles with no permit were parked in violation of regulations, including 32 that were parked after 6:00 pm. No tickets were issued.

### Area 41 - Sharp-Leadenhall

Area 41 has the most restrictive RPP regulation. No one without a permit can legally park in this area at any time.

The survey included all 52 parking spaces posted with RPP 41. 47 individual vehicles parked. The turnover rate was 0.90 vehicles/space. It is noted that the occupancy of the blocks surveyed never exceeded 51%.

Of the 47 individual vehicles that parked during the eight-hour survey, 15 had no permit and so were automatically in violation. No tickets were issued.

## Off Street Parking

An inventory was conducted of all off-street parking facilities larger than ten spaces. Off-street parking has been categorized by type as follows:

### Public

- Stand-alone public parking – a garage or lot with parking as its sole function
- Commercial – parking associated with retail or other customer oriented business

For public parking, the inventory obtained the location, the type of facility (garage or lot), the type of parking and description of the user, and also included the number of parking spaces and information on hours of operation and cost, if applicable.

The public parking facility locations and capacities are shown on Map 18.

### Private

- Business – parking primarily for employees of the business
- Institutional – school, church, etc.
- Residential – private residential parking

For private parking, the inventory included the location, the type of facility (garage or lot), the category of parking and description of the user. Over 90 off street facilities were identified.

The private parking facility locations are shown on Map 19.

## Off-Street Public Parking

The examination of off-street parking focused on the availability of public off-street parking supply, i.e. parking that is open to anyone. Public parking may be free or there may be a charge. It may have regulations such as a time limitation.

The number of vehicles parked in all the public parking facilities (standalone public parking and commercial site parking) was counted on a weeknight between 6:00 and 8:00 pm and on a Saturday night between 6:00 and 8:00 pm. In addition, the West Street Garage, the standalone public parking facility within the central commercial area, was counted between 11:00 AM and 1:00 PM on a weekday.

The stand-alone public parking facilities are shown in Table 9. All of these facilities charge to park except the William Street Parking Lot and the 600 Clement Street Lot, which are free. The William Street Lot at 1232-36 William Street is on vacant property between residential buildings and is under control of the Baltimore Development Corporation. This lot is normally used by residents and 100% occupied in the evenings. The 600 Clement Street lot is under control of the Bureau of Parks and is also used by residents.

*Table 9: Occupancy in stand-alone public parking facilities*

MAPID	NAME	ACCESS ID	SIDE	FACILITY	CAPACITY	OCCUPANCY COUNT		
						Weekday Midday	Weeknight	Saturday Night
P06	Harbor Court Garage	21	N	Garage	530		204	180
P43	West Street Garage	622	N	Garage	254	166	94	218
P72	Harborview Marine Center	549	E	Lot	216		42	58
P14	Marina Garage - top level	1305	N	Garage	101		14	28
P12	E Hughes St (between Light/Ricketts)	3173	S	Lot	54		7	19
P63	William Street Parking Lot	1399	W	Lot	13		13	13
P71b	600 Clement Street Lot	1765	S	Lot	10		10	11
P96	Arrow Parking	21	S	Garage	146	Temporarily closed for construction; reopened Feb. 2017		

The 254-space West Street Garage serves the commercial center. According to the garage manager, the West Street Garage is always full by 10 or 11 AM on Ravens game days. Otherwise, the garage will frequently fill on Friday and Saturday nights such that the entrance has to be closed except to eligible monthly permit parkers. Closures do not typically last for long because the entrance is reopened as bar/restaurant patrons depart.

This garage sells several types of monthly permits. At present over 300 monthly permits are active.

Table 10: Monthly permits at West Street Garage

Permit Type	Time of parking	Cost/Month	Active permits
Market Rate	Allows parking any time	\$120.00	68
Merchant	Allows parking any time	\$ 73.00	117
Restricted Access NP M-F 8-5	Allows parking 5pm to 8am weekdays and 5pm Friday to 8am Monday. Some residential parkers.	\$ 73.00	19
Restricted Access NP after 6pm	Allows parking Monday - Friday 6am to 6pm. Frees up spaces after 6pm for bars and restaurants.	\$ 60.00	129

For those parking at West Street Garage without a monthly permit, the first hour is always free. Then the hourly rates charged vary by time of week, with the lowest rates during the day, higher rates in the evening Sunday to Wednesday, and the highest rates in the evening Thursday to Saturday. The higher rates correspond to the busier times for the garage. The garage is within easy walking distance of 20 to 30 bars and restaurants.

The commercial site parking facilities are shown in Table 11. The largest commercial site parking lots are located at the Southside Marketplace Shopping Center and Wine Market Merritt Clubs off Fort Avenue near Lawrence Street.

All of the commercial site lots were free of charge except the 1108 S. Charles Street lot, which charges \$10 on weekends and provides bar and restaurant parking. This lot, located at the southwest corner of S. Charles and Cross Street opposite Cross Street Market, is advertised by Greenspring Realty Partners as being available for lease.

In the city-owned parking lot on Light Street adjacent to the Enoch Pratt Free Library, eight spaces are signed as reserved parking for Domino's Pizza (ID P61). The other spaces within the lot are signed for Library staff. The lot entrance is signed as Private Property.



Table 11: Occupancy in commercial site parking facilities

MAPID	NAME	ACCESS ID	SIDE	FACILITY	CAPACITY	OCCUPANCY COUNT		% UTILIZATION	
						Week-night	Saturday Night	Week-night	Saturday Night
P91a/b	Southside Marketplace	3086	-	Lot	403	149	95	37%	24%
P92	Wine Market / Merritt Clubs	3051	S	Lot	247	190	66	77%	27%
P86a/b/c/d	Baltimore Museum of Industry	1103	N	Lot	166	10	35	6%	21%
P87	MedStar Health / Corepower Yoga	1336	W	Garage	127	24	0	19%	0%
P14	Marina Garage - Rusty Scupper	1305	N	Garage	99	25	72	25%	73%
P64	175 W Ostend St - Front	2281	S	Lot	52	3	2	6%	4%
P91c	Southside Marketplace - McDonald's	3086	W	Lot	34	2	1	6%	3%
P91d	Southside Marketplace - Chipotle	3087	E	Lot	32	24	9	75%	28%
P23	Shofer's Furniture	3166	E/W	Lot	27	6	12	22%	44%
P89	Royal Farms	160	S	Lot	24	7	10	29%	42%
P28	7/11	1977	W	Lot	22	13	14	59%	64%
P29	Schofer's Furniture	3167	S	Lot	21	12	13	57%	62%
P93	7/11	1078	E	Lot	22	2	2	9%	9%
P39	1108 S Charles St Lot	1468	W	Lot	18	17	32	94%	178%
P54	Papa John's & Federal Hill Laundromat	2789	S	Lot	18	4	10	22%	56%
P70	Countless Service Center	2833	S	Lot	14	3	5	21%	36%
P20	Firestone	254	E	Lot	10	9	12	90%	120%
P48a/b/c	Crossfit Federal Hill	1042	W	Lot	9	14	1	156%	11%
P58	Ace's Hardware	2194	W	Lot	9				
P42	Mother's Federal Hill Grille	2186	E	Lot	8				
P61	Dominos	2194	E	Lot	8	8	4	100%	50%
P57	Long & Foster's Realtors	1950	E	Lot	7				
PX4	Weichert Realtors	2915	E	Lot	6				
P37	BP Gas / 1100 S Hanover St	1322	W	Lot	6	5	3	83%	50%
TOTAL					1389	527	398	38%	29%

## Off-Street Private Parking

Private parking facilities identified in the inventory are listed in Table 12 below.

The parking type is categorized with the following legend:

B Business – parking primarily for employees of the business

I Institutional – school, church, etc.

R Residential – private residential parking

X The type could not be determined

*Table 12: Off-street private parking facilities*

MAPID	NAME	ACCESSID	SIDE	TYPE	NOTES
P22	Shofer's Furniture	3166	E/W	B	
P31	Bank of America – Poultney St lot	2295	S	B	
P51	190 S Sharp St	2017	E	B	
P65	175 W Ostend St - Back	1552	W	B	
P78	BGE	1552	-	B	
P01a	Baltimore Federal Reserve Bank	1157	N	B	
P01b	Baltimore Federal Reserve Bank	1443	W	B	
P36	John's Auto Service	2763	S	B	
P52	Durapak/Vac Pak	2599	S	B	
P53	US Post Office - South Station	1284	N	B	
P73	Little Havana Parking Lot	2101	N	B	
P74	Department of Transportation	1552	W	B	
P80	Clearview Autoglass Repair & Replacement	537	W	B	
P81	Middleton & Meads Body Shop	537	W	B	
P95	The Tire Network	2770	E	B	
PX2	Pratt Thompson Co., Inc.	68	W	B	
P47a/b	Digital Harbor High School	2694	W	I	
P32a	Federal Hill Prep Middle School	1327	S	I	"School Parking 7A-5P"
P32b	Federal Hill Prep Middle School	1308	N	I	
P82	Thomas Johnson Elementary/Middle School	1475	E	I	
P35b	Sharp-Leadenhall Elementary School	1053	E	I	
P55	Advent Senior Housing	1487	W	I	
P61	Light Street Branch Library (City-owned lot)	2194	E	I	Portion of lot signed for Dominos

Table 12 continued: Off-street private parking facilities

MAPID	NAME	ACCESSID	SIDE	TYPE	NOTES
P11	Christ Lutheran Church	2877	E	I	
P18	Martin Lutheran Church	138	N	I	
P35a	Sharp-Leadenhall Elementary School	849	N	I	
P13a/b	Maryland Science Center	3140	N	I	
P24	American Visionary Art Museum	960	W	I	
P27a	Leadenhall Baptist Church	2533	W	I	'P' directional signs on WB Cross Street west of Charles St. Fenced & gated, 100 spaces total in 3 lots
P27b	Leadenhall Baptist Church	374	E	I	
P27c	Leadenhall Baptist Church	2541	N	I	
P45	Holy Cross Church	1577	N	I	
P46	Streetlite Christian Fellowship	2133	E	I	
P85	National Federation of the Blind, Jernigan institute	2715	N	I	Garage
P55	Advent Senior Housing	1487	W	I	
P21	W Wheeling St	122	N	R	
P62	1121 Wall Street Garage	1211	E	R	PABC leases 80 spaces; Gated
P76	101 Birkhead St	1727	S	R	
P84a	101 Wells Apartments	2715	S	R	
P84b	101 Wells Apartments	446	S	R	
P84c/d	101 Wells Apartments	2715	S	R	
P02a/b	Sharp St Apartments	1443	E	R	
P03	Hanover Sq Apartment Lot	994	W	R	
P04	Apartment Lot	881	E	R	
P05	S Charles St Apartments	695	W	R	
P07	W York St Apartments	2588	S	R	
P08	S Charles St Apartments	1827	W	R	
P09	W Hill St Apartments	1337	-	R	
P10	W Hughes St Apartments	2256	N	R	
P15	Montgomery Muse Apartments	209	W	R	
P16	Montgomery Muse Apartments	209	W	R	
P17	Montgomery Muse Apartments	209	W	R	
P19	E Churchill St Apartments	235	N	R	
P25	Covington St Apartments	960	W	R	
P26	Sharp Leadenhall Apartments / 1900 Leadenhall St	1003	S	R	

Table 12 continued: Off-street private parking facilities

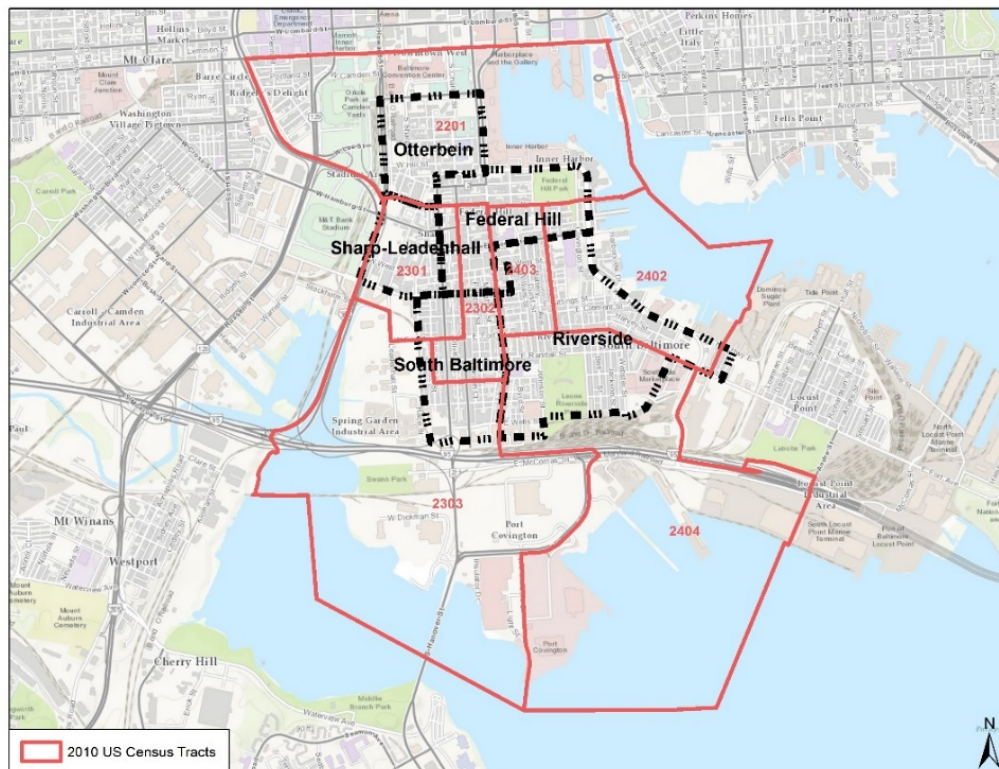
MAPID	NAME	ACCESSID	SIDE	TYPE	NOTES
P30	Olive St Apartments	2369	W	R	
P33	E Hamburg St Parking	42	E	R	
P34	Harbor Mill Apartments	628	W	R	
P38	Olive St Apartments	3099	W	R	
P40	Olive St Apartments	3099	W	R	
P41	Olive St Apartments	3099	E	R	
P44	E Cross St Apartments	1308	S	R	
P49	Pierside Apartments	1034	E	R	
P59	Abandoned Building Lot	2680	N	R	
P67	1300 Block Race St	801	W	R	
P75	Birckhead St/E Fort Ave Apartment (Driveways)	1113	E	R	
P77	Sunwalt Ct Apartments	1770	E	R	
P83	1901 S Charles St Apartments	1008	N	R	Residential Garage
PX1	900 Bevan St Lot	2098	N	R	
PX3	2 E Wells St Apartments	1198	N	R	Residential Garage
P71a	Anchor St Lot	1883	W	R	
P56	Marshall St Apartments	622	S	R	
P60	1211 Light Street	2194	E	R	
P88	Bozzuto Construction	567	W	X	Site of planned Anthem House II
P66	W Ostend St / Leadenhall St	1552	E	X	Site of future Stadium Square
P68	SW corner Light & Ostend St	1315	S	X	Building demolished, open lot - No Parking
P79	West end of Barney St	928	N	X	
P69	Gittings & Durst St at St. Ignatius	2738	E	X	Basketball Court used as makeshift parking

## Analysis

### Census Data Related to Parking Demand

Data from the US Census was examined for information on number of households and vehicles available per household. The 2010 census did not include the question on number of vehicles per household or means of travel to work. The 2000 census was compared with data from the 2010-2014 five-year American Community Survey, which did ask those questions.

Census tract boundaries don't exactly match neighborhood boundaries. Tracts are divided into smaller areas, i.e. blocks and block groups, but some data is not reported at that fine level. The tract data is sufficient to provide insight into population and parking trends. The tracts examined are shown below.



2201 - Otterbein. This tract also includes Ridgely's Delight and the northern portion of Federal Hill to Henrietta Street.

2301 – Sharp-Leadenhall. This tract includes small neighboring portions of South Baltimore and Federal Hill, but is predominantly Sharp-Leadenhall.

2302 - Portions of northern South Baltimore and western Federal Hill

2303 – Southern South Baltimore. This tract includes the Spring Garden Industrial Area and Port Covington but those areas have few if any residents, so the census data reflects South Baltimore.

2402 - Riverside east of Riverside Avenue and north of Fort Avenue

2403 - Northwestern Riverside with some neighboring Federal Hill

2404 –Riverside south of Fort Avenue.

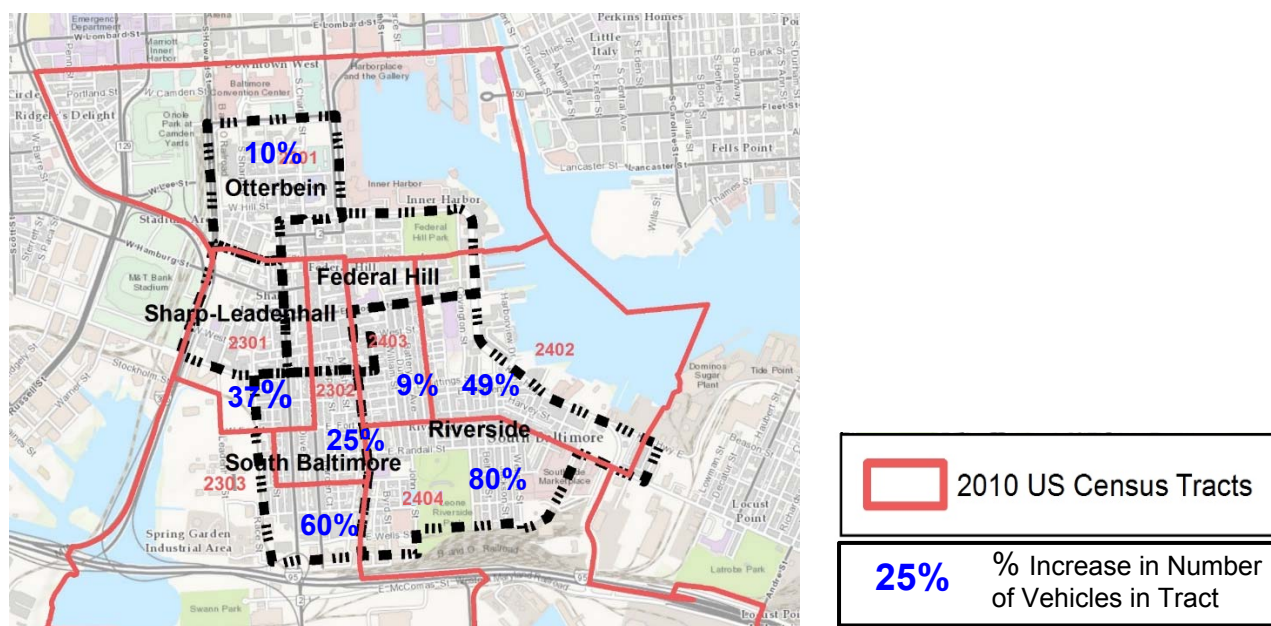
For each tract, the total number of vehicles was determined by multiplying the number of occupied units having one vehicle by one, multiplying the number of units having two vehicles by two and so on, and adding all together. The households having no vehicle are more than offset by households with two or more vehicles. Each neighborhood had a notable increase in average vehicles per household since 2000 except Otterbein.

Table 13: Change in average vehicles available per household

Census Tract	Avg. Vehicles /Household Year 2000	Avg. Vehicles /Household Year 2010-14	Percent Increase
2201	1.15	1.17	1.7%
2301	0.94	1.25	32.9%
2302	1.15	1.48	28.7%
2303	0.89	1.50	68.5%
2402	1.43	1.63	14.0%
2403	1.27	1.39	9.5%
2404	1.03	1.57	52.4%

With the increase in average vehicles per household, combined with change in number of households, the actual number of vehicles has increased, most notably in South Baltimore and Riverside.

Figure 2: Increase in number of vehicles between 2000 and 2014



The charts in Figure 3 illustrate how the number of vehicles has increased faster than the number of housing units. The largest increase has been in Tract 2404, Riverside south of Fort Avenue. The number of added households in this tract corresponds roughly to the number of units in the 101 Wells Street apartments, which were constructed after year 2002 and which provided off-street parking. However, the number of vehicles added is four times the number of new units, and many of these vehicles are apparently parked on the street. In South Baltimore tract 2303, the census data on households pre-dates opening of new apartments on E. Wells Street, yet 272 vehicles were added.

Figure 3: Comparisons of housing and vehicles in 2000 and 2010



Sources: 2010-2014 American Community Survey 5-Year Estimates, DP04: Selected Housing Characteristics; and Census 2000 Summary File 4 DP-4

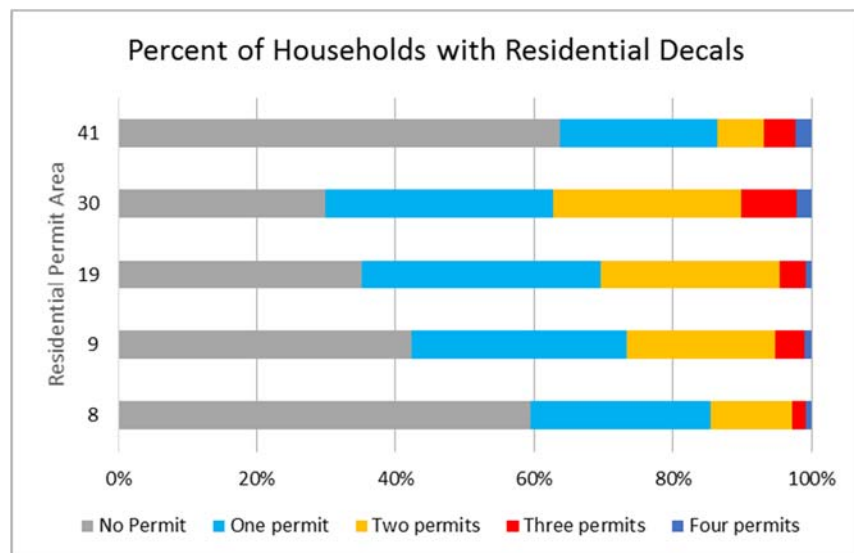
New multifamily residential buildings are being constructed with parking. But when vehicle ownership per household goes up in existing single family attached housing neighborhoods, there is no increase in parking supply and the demand for street parking goes up. Also, when existing houses were divided into apartments, or some homeowners began renting rooms, residential parking demand could increase with no increase in parking supply. All of this contributed to increasing difficulty for residents finding on street parking. The new zoning code effective June 1, 2017 added parking requirements for residential conversions.



## Numbers of Residential Parking Permits Purchased per Household

PABC provided administrative reports for numbers of eligible households in each RPP area and active residential decals and visitor permits by household. This allows a calculation of the percentage of households purchasing a particular quantity of permits. Figure 4 below shows the results for Residential decals.

Figure 4: Percent of households with residential decals



As indicated, Area 30, South Baltimore, has the lowest percentage of no-permit households and the greatest percentage of 2, 3, and 4-permit households, followed by Area 19. These two areas are generating the highest average residential vehicles parked on the street. Area 30 is equivalent to 1.2 residential vehicles on the street for every household in the RPP area. Average per household residential vehicles parked on the street in each RPP area, as measured by residential permits, is shown below.

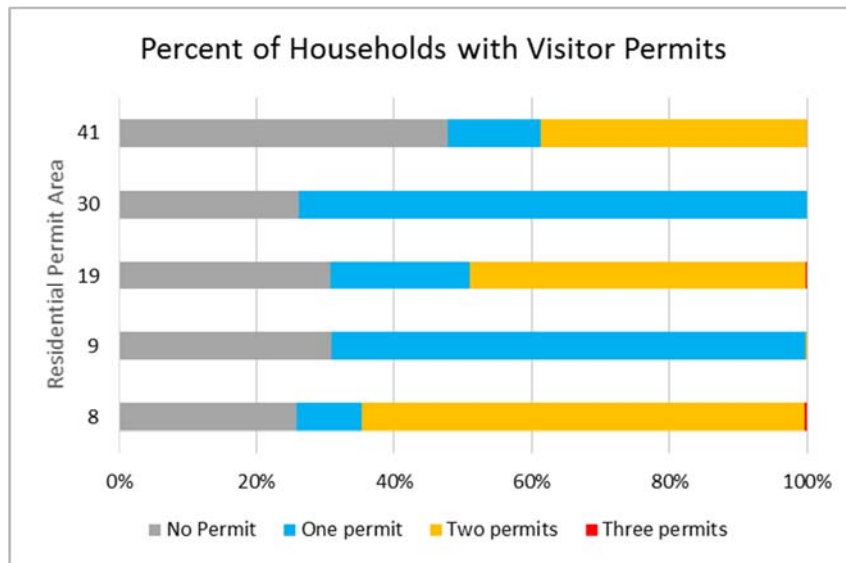
Table 14: Average residential decals per household

Residential Permit Area	Avg. per Household Resident vehicles parked on-street (residential permits)
8 - Otterbein	0.59
9 – Federal Hill	0.91
19 – S. Federal Hill	1.01
30 – South Baltimore	1.20
41 – Sharp-Leadenhall	0.59

In all areas, over 95% of households with residential permits buy one or more visitor permits. The percentage of households with no residential permit that buy visitor permit is much lower: 20% - 30%. In Area 19, a number of households with 3 residential permits buy two or three visitor permits. In Area 8, 86% of households that buy a visitor permit buy two of them.



Figure 5: Percent of households with visitor permits



Areas 9 and 30 are allowed to purchase a maximum of one visitor permit per household.

### Numbers of Residential Permits Sold Compared with Available On-Street Spaces

Three of the RPP zones (9 - Federal Hill, 19 - S. Federal Hill, and 30 - South Baltimore) already have significantly more resident decals than parking spaces.

Table 15: Residential permits sold compared with available on-street spaces

Area	Number of Spaces	Active Decals	Visitor Active	Active Decals/ Number of Spaces	Active Decals Consistent with Available Spaces?
8	524	549	1,310	105%	Yes
9	825	1,146	837	139%	No
19	639	1,191	1,361	186%	No
30	1,251	2,243	1,381	180%	No
41	52	22	31	42%	Yes

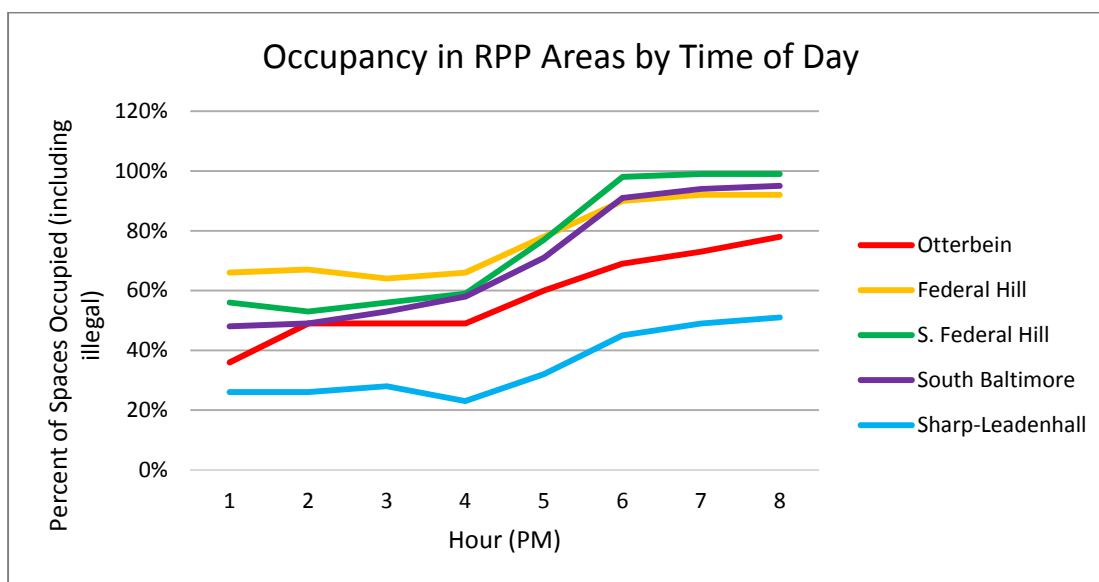
## RPP Area Turnover and Occupancy

Turnover counts were conducted on approximately half the street segments in each RPP area for an eight-hour period on a weekday starting at 1:00 PM. License plate numbers were recorded hourly, and if a vehicle displayed a permit, the type of permit was recorded. The surveyors also recorded vehicles that were ticketed for a parking violation.

The total number of individual license plates recorded during the eight-hour period on each street segment was divided by the number of parking spaces on the segment to arrive at the turnover, or number of vehicles per space.

The turnover counts also allowed a calculation of occupancy for each hour. Using all streets combined within each area, the average occupancy for each area by time of day is shown on Figure 5 below. The number of spaces on each block used for purposes of this calculation was the maximum number of vehicles parked, rather than the inventory which measured 20-foot spaces.

Figure 6: Parking occupancy in RPP areas



The figure illustrates the following characteristics observed on the sample street segments:

- All of the RPP areas have parking available during the day.
- Otterbein and Sharp-Leadenhall have adequate parking at all times. Sharp-Leadenhall parking is only about half full (although some individual blocks are more full).
- Federal Hill, S. Federal Hill and South Baltimore parking gets full starting at 6:00 pm. If the number of measured spaces from the inventory is used, occupancy exceeds 100%.

The turnover was calculated for each block and averaged for each RPP area. The turnover equals the number of individual vehicles divided by the number of spaces. For this calculation, the number of spaces used was the maximum number of vehicles parked.

Table 16: Turnover and permit usage in RPP areas

	# Parking Spaces	# Different Vehicles	Average Turnover	#Resident Permit Decal	#Guest Permit	#TEMP Permit	Legal Time Limited	%of parkers all permits	% of parkers Resident Permit Decal	Illegal NoPermit No Ticket *	Ticketed Violation	%of Violations ticketed
8 Otterbein	328	401	1.22	249	100	1	35	86%	62%	13	6	32%
9 Federal Hill	336	613	1.82	461	43	15	67	85%	75%	58	0	0
19 S. Federal Hill	300	442	1.47	304	81	6	28	90%	69%	15	0	0
30 South Baltimore	658	995	1.51	702	109	21	70	86%	71%	47	0	0
41 Sharp-Leadenhall	64	69	1.08	27	6	0	18	65%	53%	15	0	0
OVERALL	1686	2520	1.49	1743	339	43	218	86%	69%	148	6	4%

\* Includes vehicles before 6pm that stayed longer than the legal time limit

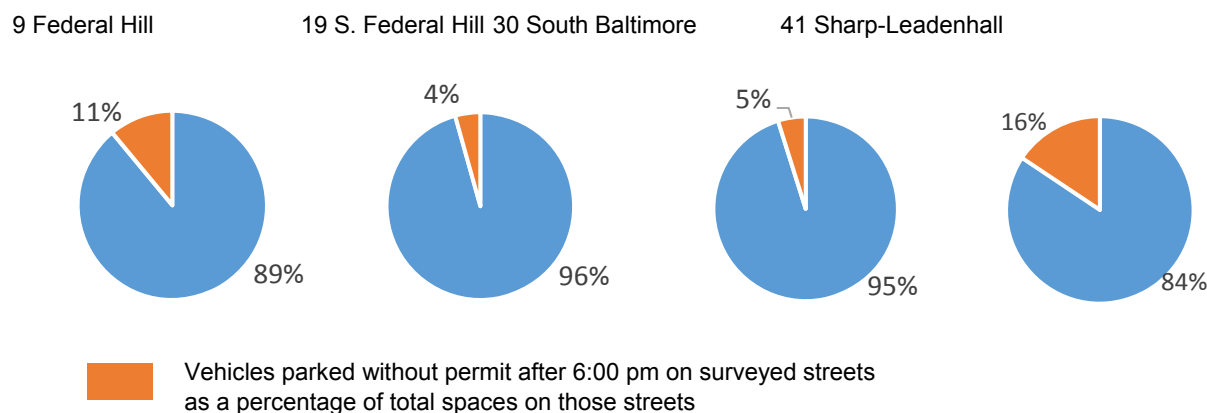
The streets sampled in Sharp-Leadenhall included 12 parking spaces with unrestricted parking and 52 parking spaces posted with RPP Area 41, which allows only permit parking at all times. It is noted that 15 vehicles without permits parked in the RPP spaces. This is possibly a result of the space availability (occupancy was low) combined with absence of enforcement.

Otterbein was the only area in which vehicles were ticketed. All of the tickets were issued on streets where no parking is ever allowed without a permit. This enforcement is easier since any vehicle without a permit can immediately be ticketed. Violations of 1-hour or 2-hour time limits were not ticketed. These violations require the enforcement officer to make repeated observations.

Except in Otterbein, the majority of vehicles violating the permit parking regulation did so after 6:00 pm. This includes vehicles that parked before 6:00 pm and remained parked and vehicles that arrived and parked after 6:00 pm.

The number of non-permit vehicles observed after 6:00 pm on the sampled street segments compared with the inventory total number of spaces on those segments is illustrated below.

Figure 7: Vehicles parked after 6:00 pm without permit



Map 16 illustrates the streets that were surveyed and the locations and numbers of parking violations during the eight-hour survey period.

The occupancy of Riverside in RPP Area 19 is higher compared with Riverside with no RPP (excluding Key Highway). This indicates that simply expanding RPP to a new area will not help that area unless other changes are also made.

*Table 17: Comparison of parking occupancy in Riverside with and without RPP*

Weekday Evening		Saturday Evening		Saturday Night	
Permit 19	No permit	Permit 19	No permit	Permit 19	No permit
109%	103%	110%	106%	111%	110%

## Changes Affecting Future Parking Conditions

Changes affecting future parking conditions include zoning code changes, new developments, changes to multi-modal transportation, and current Parking Authority initiatives.

### Zoning

The new zoning code that took effect on June 1, 2017 made some changes that affect parking.

The parking requirement for a residence in areas zoned R7 and R8 (which apply to most of the study area) is one off-street space per dwelling unit. When a single-family residence is converted to more units, one off street vehicle space per unit must be provided. It is anticipated that homeowners would need to apply for a variance to use rear yards along alleys for anything but off street parking. Rear yards that have already been used for enlarging the residence or other structure are grandfathered.

The new code exempts certain zoning districts from off-street parking requirements. In the study area, properties zoned C-1 (Neighborhood Business) and all non-residential uses in the R-MU district (Rowhouse Mixed-Use Overlay) are exempt from off-street parking requirements. The first 2,500 square feet of gross commercial floor area for properties zoned C-2 (Community Commercial) are also exempt.

There are two Transit Oriented Development (TOD) zoned districts in the study area, a TOD-2 at Anthem House and a TOD-4 at Stadium Square. In a TOD zone, for residential use no minimum parking is required. A maximum of one off-street space per residential unit plus one guest space per 15 units is permitted. Parking for non-residential uses may be provided at no more than 3 spaces per 1,000 sq. ft. of gross floor area. Anthem House and a portion of Stadium Square were approved and began construction before the new code took effect and provide parking as described in the following section.

### New Development Projects

New development can affect parking in several ways:

- If development parking demand is not provided for within the site, the development will add parking demand to surrounding streets
- The parking supply on the development curb frontages may be reduced due to new driveways, or from new regulations for the development (loading zone, valet, etc.)
- If parking is developed as part of a new development and its supply exceeds the demand, the surplus could potentially be used to meet other demands

The following developments are currently under construction. Locations are shown on Figure 6:

1. 414 Light Street - 394 luxury apartment units and 12,297 sq. ft. ground floor retail. The project is providing 458 parking spaces and 53 bicycle parking spaces. The B 5 2 zoning required 95 parking spaces (one space per four units, no parking required for retail) and 53 bicycle parking spaces. This development removed the 238-space parking lot that occupied this block in 2014.
2. Banner Hill Apartments - 611 S. Charles Street - 351 apartment units. 351 parking spaces and nine bicycle spaces are being provided. The zoning requirement was 88 parking spaces and 9 bicycle spaces.
3. Hanover Cross Street – 101 W. Cross Street – 300 residential units, 14,600 sq. ft. specialty retail, 490-space garage. On-street metered parking will be installed after completion of work.

4. Stadium Square office –137 ½ W. Ostend St. – 73,110 sq. ft. office building. The project is providing 29 off-street parking spaces.
5. Federal Place II – 1300-1320 Jackson Street and 1301-1323 Belt Street - 24 townhomes. The homes fronting on Belt Street were completed at the time of this study. Each unit provides a two-car garage, or 48 total off-street parking spaces. Approximately eight existing metered on-street spaces on Key Highway near the intersection with Jackson Street will be removed as part of a new MTA bus stop for BaltimoreLink.
6. Anthem House – 900 E. Fort Ave – 281 luxury apartments and 18,285 sq. ft. retail space. Garage with 449 off-street parking spaces.

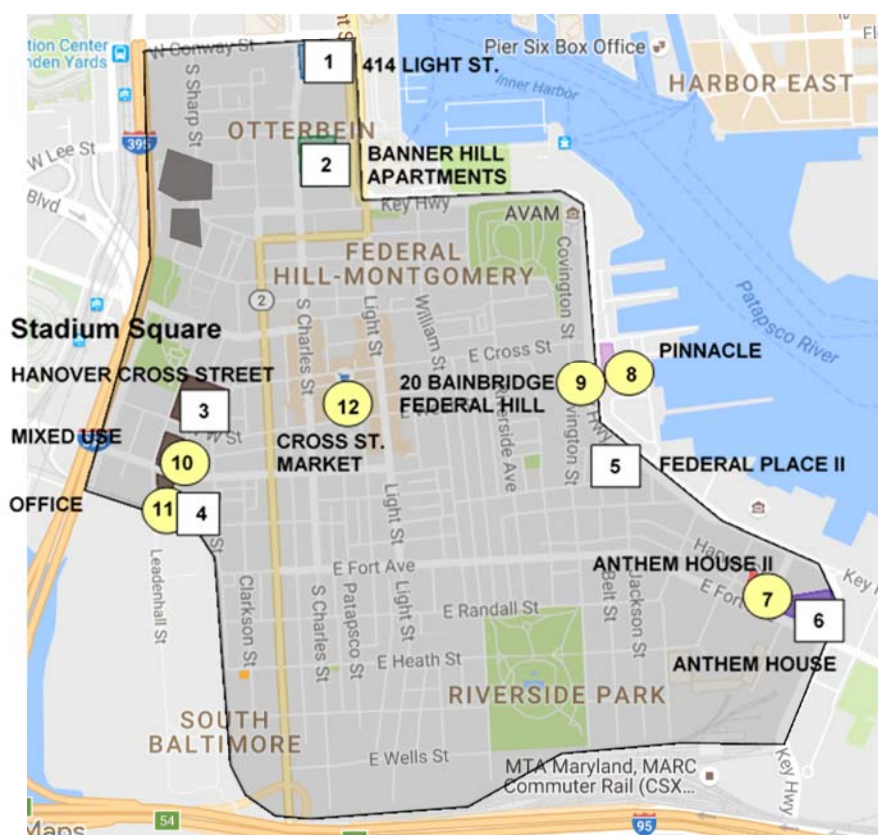
Additional developments that are planned are also shown on the map below, as follows:

7. Anthem House II – 1430 Lawrence Street - 52 apartments. The development will provide 16 off-street parking spaces. 21 on-street parking spaces will surround the site. Parking will also be available in the Anthem House garage (#6 above).
8. 20 Bainbridge at Federal Hill - 501 E. Cross Street /1100 Key Highway – Multifamily residential, 224 units with 224 off-street parking spaces. Will lose approximately four parking spaces on Cross Street for new driveways. Considering removal of meters on Key Highway along frontage. This development will displace parking on the existing unpaved lot used by the adjacent CrossFit facility.
9. The Pinnacle – 25 Pierside Drive – residential tower with 35 units. Allocating 70 spaces in existing garage to these units; six new surface guest parking spaces, storage for eight bicycles.
10. Stadium Square – Future Mixed Use Development on the block bounded by Race Street, West Street, Leadenhall Street, Ostend Street. 6-story affordable housing; 300 market rate apartments, 14,600 sq. ft. specialty retail, 490-space garage. On-street metered parking will be installed after completion of work.
11. Stadium Square future office – south side Ostend Street west of #4 above. Future 150,000 sq. ft. office building. The developer's website shows a parking structure for the Ostend Street offices.<sup>1</sup>
12. Cross Street Market redevelopment – under a 2017 agreement, Baltimore Public Markets Corporation (tenant of the city-owned Market) retained CSM Ventures, LLC to manage the Market, including physical renovation/redevelopment and leasing space to merchants. The redevelopment will add merchants and likely increase the number of customers. The plan calls for removal of some on-street parking.



<sup>1</sup> <http://stadiumsq.com/docs/stadium-square-office.pdf>

Figure 8: Current and planned development locations



Source: PABC and BCDOT

## Multi-Modal Improvements

### Bicycle Network

Baltimore City's 2015 Bicycle Master Plan's overall vision for the next 15 years is to implement bike infrastructure and policies for neighborhood livability, economic growth, public health, and the environment. The plan calls for over 253 miles of bike facilities and to enable 8% of commuters to bike as their primary transportation option by 2028.

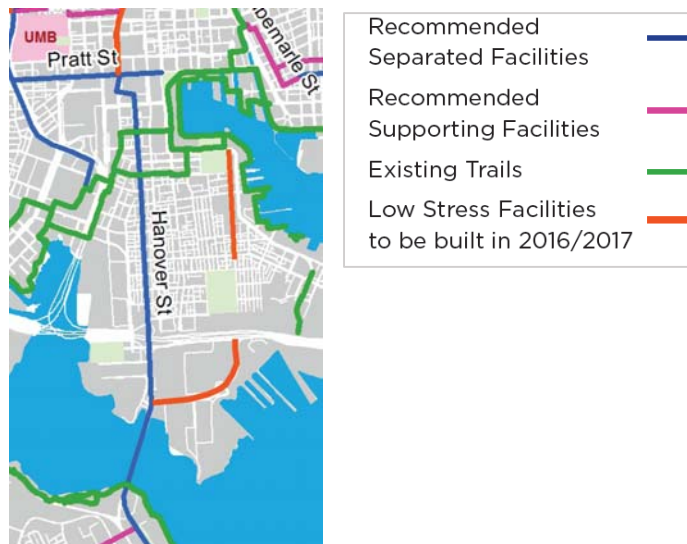
Key Highway from Light Street to Lawrence Street was identified as a main bicycle route, to be provided with bike lanes or a separated bike facility.

The Separated Bike Network Plan (Addendum to the 2015 Bicycle Master Plan, March 2017) goes further by identifying and prioritizing a set of projects to be implemented in the next two to five years that will create a "low stress" bike network that the general population will feel safe using. This will greatly increase the number of people who can meet many of their basic travel needs by bike. The Separated Bike Network Plan recommends a separated bicycle facility on Hanover Street the entire length of the study area, passing through the neighborhoods of Otterbein, Sharp-Leadenhall and South Baltimore, in the next four years.



The network shown on the map below is a subset of corridors in the 2015 Bicycle Master Plan Update, intended to create low stress facilities on these corridors

*Figure 9: Separated Bike Network Plan map of recommendations*



Each corridor will need to be designed individually, with public input and taking into account all the needs of that corridor. For Hanover Street, preserving on-street parking in the design is likely to be a major concern to the community.

### Baltimore Bike Share

Bike Share, launched in 2016, offers the public a means to get to destinations or to transit without having to drive and park. The parking study area has one existing station at Cross Street and Charles Street (Cross Street Market).

#### Cross Street Market bike share station

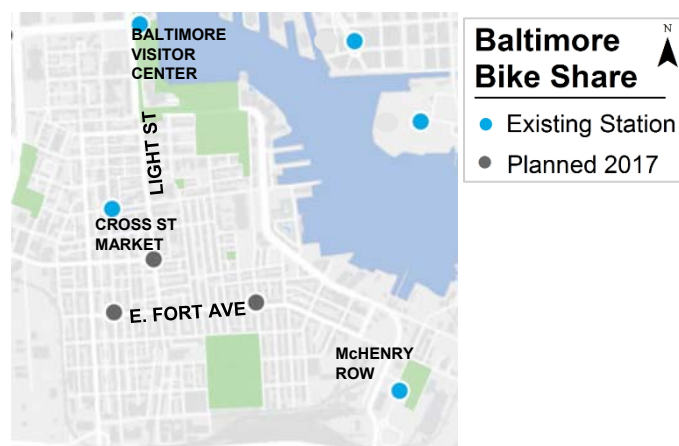




Three other Bike Share stations will be added in 2017:

- Station 43 Federal Hill 1 - E. Fort Avenue at Charles Street
- Station 44 Federal Hill 2 - E. Fort Avenue at Covington Street
- Station 50 1251 Light Street - Light Street at E. Ostend Street

*Figure 10: Existing and planned bike share locations*



Bike share stations will all be located in the roadway. At the time of this report the stations were not yet designed, but they will likely take two parking spots each as the stations are 40 feet in length. The Cross Street Market station replaced two metered spots.

### MTA BaltimoreLink

BaltimoreLink is a complete overhaul and rebranding of the core transit system operating within the city and throughout the greater Baltimore region. The new network is designed to improve service quality and reliability, maximize access to high-frequency transit, strengthen connections between MTA's bus and rail routes, and better serve existing and emerging job centers. The new service launched on June 18, 2017. To the extent improved transit allows residents and employees to rely less on private vehicles, over time it can reduce parking demand.

The BaltimoreLink bus routes within the study area are CityLink Silver and LocalLink 67 (which run along former Route 64 within the parking study area), LocalLink 94 (which replaces Route 1 within the study area) and new LocalLink 71 (new service along Key Highway, adding to existing Charm City Circulator service on Key Highway).

A minor gain in on-street parking in the study area will occur from bus stop changes. As part of a bus stop optimization process for operational efficiencies, bus stops were analyzed based on their spacing relative to adjacent bus stops. It was determined that some bus stops could be removed while still providing adequate access to riders.

Two bus stops within the parking study area are proposed for consolidation. Assuming the stops are removed as proposed, two parking spaces per stop (and in some cases three) could be added.

- Light Street southbound at Randall Street
- Hanover Street southbound at West Street

New bus stops will be located on Key Highway. However, these spaces are presently underutilized.

The gain of parking from the proposed bus stop changes will be offset by removal of parking for the three proposed bike share stations noted in the previous section, so there is no net gain.

Modifications to the bus stop network occur three times per year in conjunction with MTA's service changes, typically in February, June, and September. MTA accepts public comments on the proposed bus stop optimization, as well as other requests to add, relocate, or remove bus stops.

## Current Parking Authority Initiatives

### Project Space

Project Space is a program to reserve about 10% of parking meters for highly accessible use. Parking for those with disabilities will not be free. Disabled parking will be charged at the same rate as adjacent paid parking.

The paid parking turnover study provided an indication of current use by HC vehicles. In the eight-hour study on one weekday, 26 vehicles that displayed HC tags did not pay; many of these vehicles stayed most of the study period or all eight hours. Violators with HC tags represented about 10% of the total parking violations observed. Presence of a handicapped tag was only noted if the vehicle was in violation, so the total number of HC parkers is not known.

State law allows a vehicle with a HC plate or tag to park for double the meter duration limit up to a maximum of four hours. It is not possible to administer two different duration limits via the meters. Project Space will move the duration limit of all meters to at least a four-hour maximum everywhere (all one-, two- and three-hour maximum restrictions will be eliminated). Setting duration limits to four hours allows collection of payment from all vehicles for all hours used, and enforcement becomes easier since it is the same for all vehicles.

Originally implemented in the CBD, Project Space is now also implemented in Harbor East and Fells Point, and is being expanded to Federal Hill and Mount Vernon in 2017.

### Demand Based Pricing

The use of on-street parking is affected by the cost. The higher the cost, the more people elect to park off-street, park elsewhere, or use another travel mode. The target of demand-based pricing is to have 15% to 20% vacant spaces per block, to provide availability to drivers who most need on-street parking. Based on actual demand, incremental changes would be made to the meter rates. Evaluation of parking conditions would be conducted six months after a pricing change (although it could be a longer period) to identify areas where demand is exceedingly high and should be managed by meter rate increases in order to promote parking availability. Areas where parking is underutilized would also be identified and the meter rate would be reduced to attract parkers to where spaces are available.

PABC is conducting a pilot program of demand-based pricing in the Central Business District. In July 2017, the City Board of Estimates granted the request of PABC to allow meter rate setting authority based on demand in the Central Business District.

### Virtual Permits

Over the last two years PABC has been planning for a change from the existing RPP decals to a virtual permitting system. The system would link a permit directly to the vehicle registration record from Maryland Motor Vehicle Administration. Enforcement can be carried out either on foot using a hand-held device or using a license plate recognition camera attached on an enforcement vehicle. The license plate

recognition system compares the plate to the permit database and alerts the enforcement officer to vehicles with violations.

The virtual permit system saves costs, such as permit printing, permit mailings, and staff time to administer permit sales. In addition, the system helps prevent permit loss, theft, and forgery. Finally, enforcement is easier and takes less manpower, enabling improved enforcement.

PABC anticipates being ready to conduct a pilot project in one neighborhood by 2018.

#### Pay by Plate

PABC is testing parking meters that do not require the driver to return to the car to put a receipt on the dashboard as proof of payment. These new parking meters use the vehicle license plate number to verify payment. The driver needs to know the license plate number before paying at the meter. If adopted, this will speed enforcement capability with new camera license plate readers. Pay by Phone is a variation that allows a driver who has downloaded the app to make the whole transaction by phone. The driver can also buy more time if needed without returning to the vehicle.

## Recommendations

Parking management is the best first response. This will better reveal whether and where an increase in supply is needed.

### Demand Management

Continue to improve and promote multi-modal travel options. These include:

- BaltimoreLink transit service. Although MTA runs this service and the City does not have any direct control over service, the City can promote the benefits and upgrade facilities near transit stops.
- Charm City Circulator
- Bicycle network and Bike Share
- Walkability
- Car share
- Transportation network companies (i.e. Uber and Lyft) offer the convenience of auto travel with less parking demand, but create needs for passenger loading

Over time, this can reduce dependence on private autos and enable some households to need fewer vehicles. In particular, younger people are driving and owning cars at lower rates and if transportation alternatives are available, parking demand may decline as homes are sold to new, younger households.

### Enforcement

The effectiveness of on-street parking pricing as a way to manage demand depends on good enforcement. Perfect enforcement isn't possible but motorists should expect they will be ticketed if they park illegally or fail to pay. In the on-street parking turnover study of paid parking, fully 10% of vehicles in two-hour, three-hour, and four-hour limit zones parked for a duration of 5 to 8 hours. 33% of all vehicles on paid parking blocks did not pay. On the 1000 Block of Light Street (between Hamburg Street and Cross Street), up to one-third of available spaces were occupied at one time by vehicles with HC tags that did not pay, and 44% of all vehicles that parked on that block during the eight-hour study did not pay. Absence of enforcement works against the goal of keeping spaces open and available, and makes it difficult to determine what the price should be.

#### Enforcement responsibility

Today, parking enforcement is under the Safety division of BCDOT. BCDOT Transportation Enforcement Officers are used for traffic control during commuter peak periods and in emergency situations, so parking enforcement is diminished during those periods. In RPP areas, enforcement is generally performed in response to 311 complaints, where a resident has observed a particular vehicle repeatedly parking without a permit. When enforcement goes to that location, it will check the entire block and ticket all illegal parking. This manner of parking enforcement pays most attention to the "squeaky wheel". Strong enforcement should be consistent, frequent and regular, not occasional strict operations.

**Baltimore City should have a dedicated parking enforcement unit with adequate staffing, resources, equipment and management software.** It is beyond the scope of this report to determine whether such a dedicated unit should reside within BCDOT, PABC, or another agency. There is reason to consider whether parking enforcement should reside with PABC, to create a more seamless coordination of parking management tools. Enforcement observations and data are important to PABC's evaluation of parking regulations and decisions on whether adjustments are needed.

A random sample of municipalities surveyed as part of this study indicated that parking enforcement usually resides in a dedicated unit. This is the case regardless of whether enforcement is done by the same agency that plans and operates parking. *On-Street Parking Management, Sustainable Urban Transport Technical Document #14* reinforces this as a best practice, stating that “Parking enforcement is best carried out by a dedicated force of parking wardens, whose focus is parking. Such wardens always do better at this than traffic police, who have other priorities.”

Surveyed municipalities chose a number of different approaches, with enforcement responsibilities varying among departments of transportation, parking authorities, public works departments, police departments, and other agencies. This is generally a local decision.

### Enforcement technologies

More efficient enforcement will be possible after the planned introduction of virtual permit parking in the RPP areas and the pay-by-license plate and pay-by-phone technologies in the metered areas, integrated with License Plate Recognition (LPR) camera enforcement.

With pay-by-plate, consumers enter their license plate number at the payment kiosk to purchase parking time, make their payment and go. The license plates for paid parking are added to a database of permitted vehicles and updated in real time to the LPR software in enforcement vehicles. With virtual permits, the license plate numbers of permitted vehicles are stored in the database rather than using hang tags or decals.

The parking application software matches incoming license plate reads from the camera against a list of license plate numbers, and automatically alerts operators to vehicles with unpaid fines, expired time limits and without permits. It can also be used to identify Visitor permits that are being used inappropriately for long term parking like a residential decal.

Using LPR cameras mounted on parking enforcement vehicles, parking enforcement officers can patrol the district to automatically identify the vehicles that should be ticketed. Operators can optimize their routes and become more efficient at covering many types of parking zones.

### Fines

Studies of parking violations typically show that a surprisingly large portion of illegal parking is by a relatively small group who make a habit of it. This suggests graduated fines, increasing with the third offense.<sup>2</sup>

### Residential Permit Parking Management

Residential permit parking is typically used to assist residents in finding parking spaces near their home in residential areas that are adjacent to businesses, transit facilities or large institutions. RPP is less effective in areas where the residential parking demand exceeds the supply of on-street spaces, such as in the neighborhoods of Federal Hill, South Baltimore, and S. Federal Hill. Although a residential permit is not a guarantee of a space, many residents have an expectation that having a permit will allow them to find a space near their home. The numbers of permits issued should be reduced to more reasonably conform to the available spaces. There are several means of bringing permits issued in line with available spaces.

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<sup>2</sup> On-Street Parking Management, Sustainable Urban Transport Technical Document #14, Paul Barter, 2014, p. 88

### Number of permits per household

All of the permit areas allow up to four residential permits per household. As a first step, it is recommended that the maximum number of residential permits per household be reduced to three. Few households purchase this many permits so it would not impact many residents but it will remove 41 vehicles from the street in Area 30.

*Table 18: Number of residential decals purchased*

Decals purchased	Number of Households in RPP Area				
	8	9	19	30	41
None	546	481	390	554	28
One	239	354	384	610	10
Two	109	244	286	506	3
Three	17	48	42	146	2
Four	8	11	10	41	1

### Pricing

Residential permits in Baltimore cost \$20 per year. About half the U.S. cities that charge for residential permits have a higher permit fee. The table below was compiled by a news organization in Portland, Oregon. The prices shown do not indicate those that charge more for multiple permits. For example, in Philadelphia, the Philadelphia Parking Authority charges \$50 for a second vehicle, \$75 for a third vehicle, and \$100 for a fourth vehicle in the same household.

### **RESIDENTIAL PARKING PERMIT PRICES 75 MOST POPULOUS U.S. CITIES**

CITIES		HIGHEST ANNUAL PERMIT PRICE	OTHER PERMIT PRICES	POPULATION
1	Portland, OR	\$210 in Zones N, G	\$180 in Zone M; \$60 in all other zones	639,863
2	Oakland, CA	\$160 in Area M	\$82 in all other areas	420,005
3	San Francisco, CA	\$127		870,887
4	Omaha, NE	\$100		446,970
5	Tucson, AZ	\$72		530,706
6	Memphis, TN	\$50		652,717
7	New Orleans, LA	\$40		391,495
8	Philadelphia, PA	\$35		1,567,872
9	San Jose, CA	\$35		1,025,350
10	Washington, D.C.	\$35		681,170
11	Los Angeles, CA	\$34		3,976,322
12	Long Beach, CA	\$33		470,130
13	Riverside, CA	\$33*		324,722
14	Seattle, WA	\$32.50		704,352
15	Santa Ana, CA	\$32.40		334,217
16	Charlotte, NC	\$30		842,051
17	El Paso, TX	\$30		683,080
18	Las Vegas, NV	\$30		632,912
19	Cincinnati, OH	\$30		298,800
20	Houston, TX	\$27.95		2,303,482
21	Chicago, IL	\$25		2,704,958
22	Columbus, OH	\$25		860,090
23	Miami, FL	\$25		453,579
24	Minneapolis, MN	\$25		413,651
25	San Antonio, TX	\$20		1,492,510

26	Louisville, KY	\$20	616,261
27	Baltimore, MD	\$20	614,664
28	Atlanta, GA	\$20	472,522
29	Raleigh, NC	\$20	458,880
30	Pittsburgh, PA	\$20	303,625
31	Chula Vista, CA	\$20	267,172
32	San Diego, CA	\$15	1,406,630
33	Austin, TX	\$15	947,890
34	Anaheim, CA	\$15	351,043
35	Saint Paul, MN	\$15	302,398
36	Irvine, CA	\$12.50	266,122
37	Anchorage, AK	\$12	298,192
38	Phoenix, AZ	\$10	1,615,017
39	Nashville, TN	\$10	660,388
40	Kansas City, MO	\$10	481,420
41	Cleveland, OH	\$10	385,809
42	Lexington, KY	\$10	318,449
43	St. Louis, MO	\$10	311,404
44	Newark, NJ	\$10	281,764
45	Dallas, TX	\$6.50	1,317,929
46	Indianapolis, IN	\$0	855,164
47	Fort Worth, TX	\$0	854,113
48	Denver, CO	\$0	693,060
49	Boston, MA	\$0	673,184
50	Milwaukee, WI	\$0	595,047
51	Albuquerque, NM	\$0	559,277
52	Fresno, CA	\$0	522,053
53	Sacramento, CA	\$0	495,234
54	Colorado Springs, CO	\$0	465,101
55	Virginia Beach, VA	\$0	452,602
56	Tampa, FL	\$0	377,165
57	Bakersfield, CA	\$0	376,380
58	Aurora, CO	\$0	361,710
59	Honolulu, HI	\$0	351,792
60	Stockton, CA	\$0	307,072
61	Greensboro, NC	\$0	287,027
62	New York City, NY	No Program	8,537,673
63	Jacksonville, FL	No Program	880,619
64	Detroit, MI	No Program	672,795
65	Oklahoma City, OK	No Program	638,367
66	Mesa, AZ	No Program	484,587
67	Tulsa, OK	No Program	403,090
68	Arlington, TX	No Program	392,772
69	Wichita, KS	No Program	389,902
70	Corpus Christi, TX	No Program	325,733
71	Henderson, NV	No Program	292,969
72	Plano, TX	No Program	286,057
73	Lincoln, NE	No Program	280,364
74	Toledo, OH	No Program	278,508
75	Orlando, FL	No Program	277,173

Source: KATU News, Portland, OR, "Portland has most expensive residential parking permits of any major US city", June 19, 2017

It is recommended that PABC charge a higher price for permits beyond the first permit. Curb space is a limited resource, and the frontage width of most of the residences is equivalent to only one parking space.



The first permit should remain at \$20. Charging a higher price for a first permit is not likely to change demand since the first vehicle is most likely to be a necessity. Residents would be upset at a price increase but would still buy the permit.

The price for a second permit in the same household should be higher, for example \$40. This is still far below the cost of off-street parking. The price for a third permit should be significantly higher in the event the household wants to park three vehicles on the street. A charge of at least \$100 is recommended. Residents should understand that they are already paying a significant price to own and operate a third vehicle, including registration, insurance, inspection, maintenance, gas, etc.

#### Ration total number of permits issued in an area

In areas where demand exceeds supply, the total number of permits issued should be limited by some means such as a waiting list and/or by pricing. A waiting list is more equitable for all income levels.

Consider adding language such as the following to RPP regulations and the information provided on the PABC website:

“Where it appears that the number of permits issued would exceed the number of legal on-street parking spaces, the total number of permits may be decreased at the discretion of the Director of the Parking Authority of Baltimore City or his/her designee.”

The appropriate number of residential permits can be estimated using the following process:

- Choose the time period to use as the benchmark. Saturday night was the highest occupancy period surveyed during this study in all RPP areas, and that is used in this example.
- Choose the maximum occupancy target. At night after most residents are home there will be less need for open spaces, so 90% or 95% occupancy is appropriate. In this example 95% maximum occupancy is used.
- For each RPP area, for the existing occupancy determine what factor will bring it to 95%.
- Apply that factor to the current number of active residential permits to determine the target number of permits for that RPP area.

*Table 19: Estimation of target number of residential permits*

Permit Zone	Number of Spaces in RPP blocks	Number of Permits (2016)	Sat Night Occupancy (2016)	Factor for max 95% Occupancy	Target number of permits	Difference from 2016
8 - Otterbein	524	549	94%	1.01	555	6
9 - Federal Hill	825	1146	106%	0.90	1027	-119
19 - S. Federal Hill	639	1191	111%	0.86	1019	-172
30 - South Baltimore	1251	2243	112%	0.85	1903	-340
41 - Sharp-Leadenhall	52	22	58%	1.64	36	14

This does not translate into a set ratio of residential permits to available spaces because each area is different in the ratio of households to spaces and the average number of permits (residential and visitor) purchased per household. The ratio of permits to spaces in each area resulting from the example calculation is shown on the following page.



Permit Zone	2016 active permits/ number of spaces	Target permits/ number of spaces
8 - Otterbein	1.05	1.06
9 - Federal Hill	1.39	1.24
19 - S. Federal Hill	1.86	1.60
30 - South Baltimore	1.8	1.52
41 - Sharp-Leadenhall	0.42	0.69

Use of virtual permits, improved enforcement and improved multimodal travel options will affect occupancy over time. By tracking the number of active permits and measuring peak occupancy every year, the target number of permits can be refined.

The total number of permits in a zone should be reduced gradually through attrition. A household should always be able to purchase one residential permit, unless the residence is in a TOD zone or a new multifamily building. If the active permits exceed the target number, households seeking a second or third permit would go on a waiting list.

#### RPP zones and regulations

The existing RPP regulations appear to be effective with regard to discouraging parking from special generators like Convention Center or the stadiums. All areas appear to have adequate parking during the day.

Area 8 (Otterbein) was observed to have acceptable parking occupancy levels at night, which is the problem time period in other areas. There is no cause to alter the existing regulations.

In Area 41 (Sharp-Leadenhall), no one without a permit can park at any time. While this regulation is allowed under City Code, the regulation here appears to be unnecessarily restrictive. The occupancy of Area 41 was low at all times. Consider changing the regulation to allow 2-hour parking. This RPP zone is also very small. It may make sense to combine this area with the Otterbein RPP area.

Areas 9, 19 and 30 have similar problems with difficulty finding parking at night, or at least finding parking close to home. If excess parking demand in Area 19 or 30 is using unregulated blocks in Riverside, expanding Area 19 in Riverside may help conditions on the blocks converted to RPP.

Covington Street in Area 9, adjacent to Federal Hill Park, has a large parking supply that is unused at night. Covington Street in Area 19 is overfilled. Consider changing the regulation on Covington Street at the Park to allow both Area 9 and Area 19 permits.

#### Paid Parking

Areas that have very low demand and turnover should be considered for a reduction in rates. These areas include Covington Street at Federal Hill Park (existing rate \$2.00/hour) and Key Highway north of Jackson Street (existing rate \$0.50/hour).

The occupancy and turnover is also very low at the meters on Henrietta Street at Shofer's, even though these meters have the lowest rate in the study area at 20 cents/hour. If these meters remain, the rate

should be increased to 25 cents. The minimum rate for meters should be 25 cents since that is the increment that will be used for demand-based pricing.

The top existing rate is \$2.00, found on Light Street north of Key Highway, Key Highway between Light Street and Covington Street, and Covington Street at Federal Hill Park. The rate on Covington Street should be reduced. Even during the baseball game events this parking was less than 50% full.

In the neighborhood commercial area the rate is \$1.50/hour increasing to \$2.00/hour from 5pm – 8pm. The \$2.00 evening rate is reasonable. At lunchtime, parking is full on some metered blocks but spaces are available on nearby metered blocks. In the evening after 6:00pm the meters are highly occupied, but the adjacent unmetered blocks are also full. It is recommended that enforcement be a first step in parking management to get a true picture of demand at the existing meter rates, before adjusting rates.

On-street costs are compared with the rates at the West Street Garage in Table 20. In addition, the lot at the corner of S. Charles Street and W. Cross Street charges a flat rate of \$10.00 for evening parking.

Table 20: Comparison of on-street and off-street parking cost in central commercial area

Duration of Stay	Time Period	On-Street existing hourly rate	On-Street cost at existing rate	West Street Garage cost	On-Street hourly rate for parity with Garage
Three Hours	Daytime	\$1.50	\$4.50	\$8.00	\$2.75
	Evening – Sun.-Wed	\$2.00	\$6.00	\$10.00	\$3.25
	Evening – Thurs.-Sat.	\$2.00	\$6.00	\$17.00	
Four Hours	Daytime	\$1.50	\$6.00	\$14.00	\$3.50
	Evening – Sun.-Wed	\$2.00	\$8.00	\$14.00	\$3.50
	Evening – Thurs.-Sat.	\$2.00	\$8.00	\$17.00	

Lot entrance at southwest corner of S. Charles Street and W. Cross Street



## Better Directional Signing to West Street Garage

The existing sign to West Street Garage on Light Street not very visible, particularly the arrow. The direction can easily be missed by a driver. The large “P” symbol sign on S. Charles Street is much more visible. A uniform parking directional sign that is used city-wide is the best way to maximize driver recognition of parking opportunities.

Sign on southbound Light Street



Sign on northbound S. Charles Street



The West Street Garage is one block from the Cross Street Market via Patapsco Street or Marshall Street. However, this is not apparent. Pedestrian-level signing at West Street to the Market and at E. Cross Street to the Garage would increase public awareness of the garage as a parking resource for the Market.

West Street at Patapsco Street



## Additional Supply

### Angle Parking

Streets in the study area were examined for potential new angle parking. A number of street segments have already been converted to angle parking by BCDOT. Streets which currently have angle parking are:

- Covington Street between Key Highway and Grindall Street (front-in angle parking)
- Covington Street between E. Barney Street and E. Randall Street (front-in angle parking)
- Johnson Street between E. Wells Street and E. Randall Street (front-in angle parking)
- Webster Street north of Key Highway (front-in angle parking)
- E. Montgomery Street between Light Street and William Street (front-in angle parking)
- William Street between Key Highway and E. Montgomery Street (front in parking)
- Race Street between W. Fort Avenue and W. Ostend Street (back-in angle parking)
- Randall Street between Race Street and one block west of Light Street (back-in angle parking)
- Lawrence Street between Fort Avenue and Harvey Street -- this angle parking is proposed to be removed from Lawrence Street as part of vehicle lane and bicycle lane changes recommended in the Lawrence Street Study.

Street segments that currently have angle parking are shown on Map 17.

In general, angled parking is designed as 60-degree parking which by rule of thumb yields a 9/5 increase on the block face compared to parallel, or a 40% increase in parking on the entire block. In some instances, a two-way street can be converted to one way in order to accommodate angle parking, provided adequate traffic circulation is maintained.

The minimum width for a one-way street with 60-degree angle parking on one side and parallel parking on the other side is 38 feet. Streets in the study area 38 feet wide and wider were mapped. Streets that function as major traffic streets are not good candidates for angled parking, so these were dropped from the map. The remaining street segments were reviewed further to see whether there is a demand and whether all the criteria could be met.

BCDOT has not conducted a systematic evaluation of streets to determine candidates for angle parking. The existing angle parking has been installed as a result of community requests. Current BCDOT policy is to require a petition signed by 70% of residents on the block face where angled parking would go.

In the neighborhoods of Federal Hill, South Baltimore, and Riverside, where demand is often greater than supply, streets should be considered for back-in angle parking if:

- The demand for street parking on that street and/or on nearby streets is high
- The street is not a major traffic carrier or bus route
- Curb to curb width is 38 feet or wider and the street is currently one-way
- Curb to curb width is 38 feet or wider, the street is currently two-way but is feasible to convert to one-way. In order to convert to one-way, the traffic circulation and access would need to be evaluated and deemed adequate by BCDOT.
- Two-way streets that are at least 48 feet wide could remain two-way and add angle parking

Map 17 illustrates streets to examine for potential angled parking based on a preliminary screening, before the necessary traffic circulation and access evaluation by BCDOT. **The potential gain in number of street spaces is about 80 spaces in Federal Hill, 200 spaces in Riverside, and 20 spaces in South Baltimore.**

The streets to examine for angle parking are:

#### In Federal Hill

The listed street segments are all one-way except where noted.

- Warren Avenue between Light Street and Henry Street. Warren Avenue is two-way and is 48 feet wide, so could accommodate angle parking while remaining two-way.
- E. Montgomery Street between William Street and Battery Avenue.
- William Street between E. Montgomery Street and E. Hamburg Street.
- Battery Avenue between E. Montgomery Street and Warren Avenue. 800 block
- Riverside Avenue between Warren Avenue and E. Hamburg Street.

#### In Riverside

The listed street segments are all currently two-way. Adding angle parking would require conversion to one-way.

- Covington Street between E. Cross Street and E. Gittings Street
- Jackson Street between Key Highway and E. Fort Avenue
- E. Clement Street between Covington Street and Key Highway
- E. Barney Street between Light Street and Johnson Street
- E. Heath Street between Covington Street and Webster Street
- Byrd Street between E. Fort Avenue and Randall Street
- Henry Street between E. Fort Avenue and Randall Street
- Covington Street between E. Fort Avenue and Randall Street
- Randall Street between Light Street and Webster Street
- Webster Street between Randall Street and Key Highway (coordinate with circulation on E. Clement Street at Key Highway)

#### In South Baltimore

- W. Clement Street between Race Street and S. Charles Street. This street is two-way and adding angle parking would require conversion to one-way.

Increasing the number of on-street parking spaces by implementing angle parking is a practical way to locate additional parking near residences.

BCDOT policy is that any new angled parking will be back-in. This design has the safety advantage of providing parkers with good visibility when pulling out of a space since they are leaving head first. Entering a back-in angle space is not much different than parallel parking, which also requires the driver to back into the space.

Consider adding angle parking on all streets that pass the evaluation process. The petition process makes sense with an action like Residential Permit Parking, in which a monetary cost will be imposed on the homeowner. With angle parking, no cost is imposed. Homeowners may prefer not to have more cars parked on the street where they live. However, the street is not the personal space of the adjacent homeowners but is owned by the City and is public space. It is proposed that BCDOT should be able to add parking to serve the public, who in fact will be near neighbors of the street.

## West Street Garage

One question asked at the outset of this study is whether an additional level of parking should be constructed on the West Street garage. This three-level garage structure was designed to be able to add a fourth level at a future date. The current capacity is 254 spaces.

Adding a level would net a modest 80 spaces and cost approximately \$2 – 2.5 million. Tandem or stacked valet parking could be considered on the new top level in the busiest periods, if the revenue from the additional spaces can offset the valet cost. The garage would need to be taken out of service for approximately two months for public safety during construction of major items like the new deck, ramp and extension of elevator and stair towers.

While the West Street garage typically fills to capacity for short periods on weekend evenings and during events, it is not filled daily on a regular basis. This is partly because PABC limits the number of monthly permits that are sold, in order to keep spaces open for retail parking. There is a waiting list for monthly permits.

In the future, several factors point to an increase in demand for parking at West Street garage:

- Redevelopment of Cross Street Market will increase customer demand.
- As part of the redevelopment, on-street spaces on one side of Cross Street at the market reportedly will be removed to enhance the exterior, removing about 12 existing spaces.
- Eventual redevelopment of the 1100 S. Charles Street lot will remove 30 off-street spaces now used for restaurant parking.
- Better enforcement of on-street parking regulations could cause some parkers to shift to the garage.

Because street parking in the area is generally full, and there is no other opportunity to create additional parking close to the commercial area, expansion of the West Street garage would benefit the area businesses and the neighborhood.

If the West Street garage is expanded, it is recommended that a temporary parking location be set up for the period that the garage would need to be closed. Depending on the timing of construction, a location within the Stadium Square development area may be available for temporary parking. If a location is found but it is outside the desirable walking distance, a shuttle service could be considered during the busiest times (lunch time and evening).

## Shared Parking

The most common shared parking agreements allow owners of private parking lots, which often serve their patrons within a specific timeframe, to open their parking lots to the public or to a specific user group during other times. This can benefit the community because it provides additional parking without having to construct it. It can benefit the private lot owner because if parking charges are collected, the owner can collect some or all of the revenue.

In Baltimore, no land may be used as a parking lot nor may any building be razed so as to permit the use of the land as a parking lot unless authorized by an ordinance of the Mayor and City Council. This requirement is to permit the Mayor and City Council to consider and evaluate the need for the parking lot, the proposed appearance of the parking lot, and possible aesthetic damage to the area surrounding the parking lot, with particular respect to the proposed removal of historic or aesthetically valuable properties.



### Explore shared use of existing private commercial and institutional parking lots.

Shared parking arrangements could provide a source for evening residential parking. This would not have the same requirements for shared parking that the Zoning Code requires for two or more distinct uses in a new development. Zoning requires a calculation of the specific number of spaces for each use and calculation of the reduction allowed for shared use. Rather, for the study area shared parking can be a mechanism for making more productive use of otherwise unused parking spaces at an existing use. The amount of parking that could be made available for shared use during specific times is up to the property owner.

This type of shared parking provides flexibility for uses to share accessory parking spaces when existing spaces are not fully utilized. Property owners can charge a fee or create another type of arrangement to make unused parking available. In this scenario, the existing parking supply meets the minimum requirement for the property owner and provides additional parking resources to the area. This type of shared parking can often be arranged outside of a city process. Business owners, residents, commuters, etc. can approach the owners of these accessory spaces to discuss shared parking arrangements that are mutually beneficial.<sup>3</sup>

Shared use in the Baltimore City zoning code requires the uses being served to be within 600 feet of the parking facility. For the study area, use of the parking would be by choice, so a maximum distance is not proposed. People will judge the distance based on the alternatives they have now on the street. For information, the table below indicates maximum acceptable walking distance from parking to various types of destinations. These distances assume good pedestrian conditions (sidewalks, crosswalks, level terrain), outdoors and uncovered, with a mild climate.

*Table 21: Acceptable walking distances*

Adjacent (less than 100 feet)	Short (Less than 800 feet)	Medium (less than 1,200 feet)	Long (Less than 1,600 feet)
People with disabilities Deliveries and loading Emergency services Convenience store	Grocery stores Professional services Medical clinics Residents	General retail Restaurant Employees Religious institution	Airport parking Major sport or cultural event Overflow parking

Source: Victoria Transport Policy Institute

### Potential locations for shared parking

#### Southside Market Place

The Southside Market Place has 403 spaces, not including the retail pads for McDonalds and Chipotle which have their own adjacent parking areas. There is a pedestrian-only walkway to the shopping center from Boyle Street that brings this parking within walking distance to several residential blocks south of Fort Avenue. This parking lot had 250 empty spaces on a weeknight and 300 empty spaces on a Saturday night.

The Market Place driveway is posted with signs warning of no overnight parking. For any kind of shared parking arrangement, some entity would need to negotiate an agreement with the shopping center owner which would involve time periods, eligibility, cost, and insurance. One advantage to the shopping center

<sup>3</sup> Denver Strategic Parking Plan, Departments of Public Works and Community Planning and Development, October 2010

might be that there would be a stream of potential regular customers that would be coming to the center most days. The parking could be time permitted like the residential permits in West Street garage.

Southside Marketplace signs prohibit unauthorized vehicles:



#### The Baltimore Museum of Industry

This lot has 166 spaces. The Museum hours are 10:00 am – 4:00 pm Tuesday through Sunday, and the lot is almost empty in the evenings. While the lot is across Key Highway from the residential areas, it is a walkable distance for several residential blocks north of Fort Avenue.

#### MedStar Health/Corepower Yoga

This 127-space garage is almost empty during both weekday and weekend evenings after the businesses close. Located on the south side of Key Highway opposite the Baltimore Museum of Industry, it does not involve crossing the highway and is closer to the residential areas.

#### Digital Harbor High School

The school lot has 87 parking spaces. Approximately half of the spaces were empty during both a weeknight observation and a Saturday night observation.

A Community Association is an appropriate entity to explore these and other opportunities for shared parking.

The location of spaces and any fees for use would need to be agreed upon. A written agreement that is recorded is the best way to make sure that both sides understand and abide by the agreement. A shared parking agreement would be implemented between private parties.

Since changes in ownership, operations, or use of a site might alter parking demand in the future, the agreement needs to be for a short enough term that can be renegotiated based on the site's changed parking needs.



## Other

### Unbundled Parking

The costs of parking are often bundled into the rent or purchase price for residential and commercial units and buildings. This practice assumes that all tenants and owners have the same parking demand; therefore, regardless of car ownership all tenants and owners bear the costs of parking through increased rents or purchase prices. Including costs of parking in rents and purchase prices is a disincentive for using alternative transportation modes. Separating the payment of parking from the rent payment or purchase price, also known as “unbundling”, can provide a more equitable allocation of costs by allowing tenants and owners to pay only for the parking they use. The dwelling units then become more financially attractive for households without vehicles. Given that unbundling can reduce parking demand, if some households do not use their allotted parking space, development projects that unbundle parking may be a source of additional public parking.

On the other hand, residents of a building that charges separately for the parking may seek to avoid that cost and park on the street. A residential parking permit would be cheaper. However, residents who need parking should purchase the parking in that building, and should not be allowed to apply for a residential parking permit.

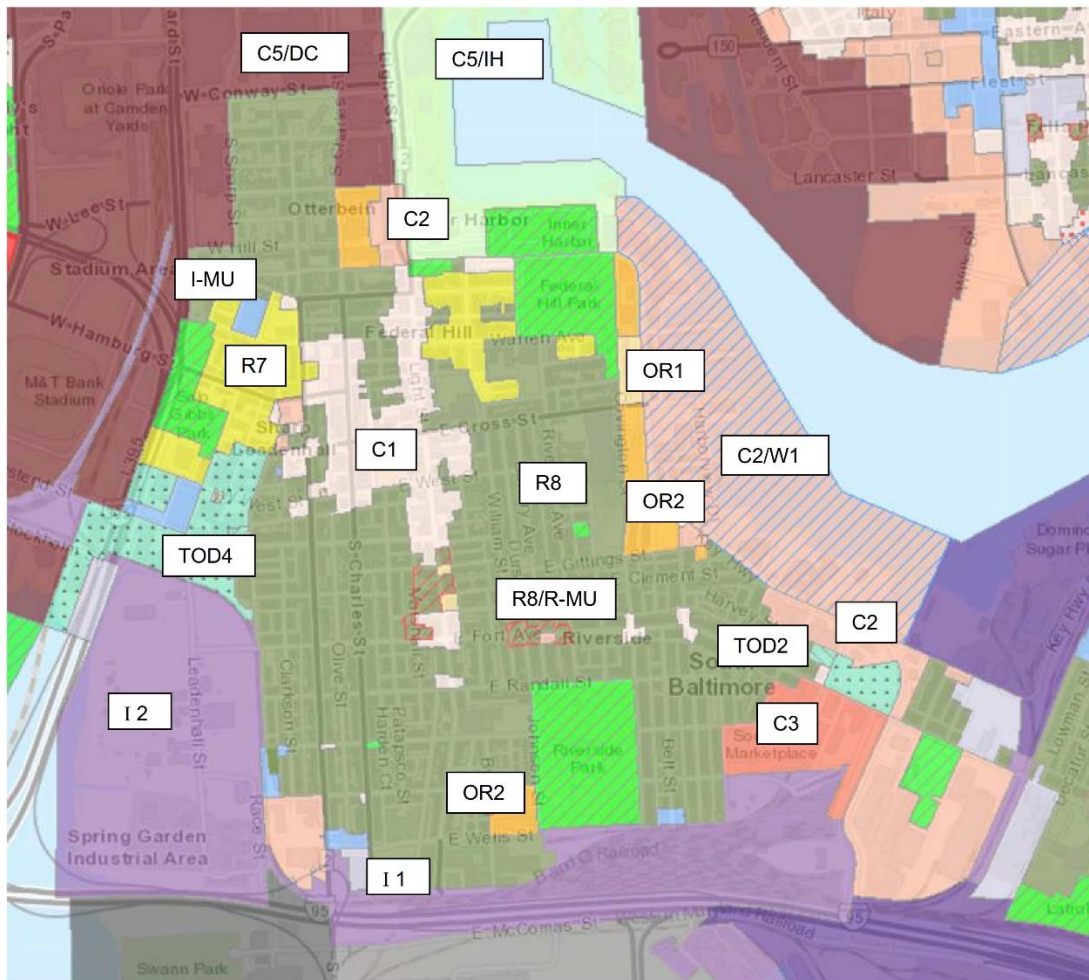
### Parking guidance





Parking guidance systems can help alleviate congestion and help people avoid the stress and frustration involved with driving around looking for parking. A parking guidance system that shows drivers where they can find available parking spaces in a given area or parking structure can also help drivers pay more attention to pedestrian and bicyclists instead of focusing on looking for an available parking space.












### Consistent time limit for passenger loading regulation

The inventory revealed that there are five different time limits related to passenger loading in the study area: 3 minutes, 5 minutes, 10 minutes, 15 minutes, and 20 minutes. One time limit, or at most two different time limits (say 10 and 20 minutes), would be more reasonable.

## Zoning Districts in the South Baltimore Neighborhoods



- |   |            |   |
|---|------------|---|
|  | <b>C-1</b> | Commercial clusters or pedestrian-oriented corridors of commercial uses that serve the immediate neighborhood. Ensures compatibility between neighboring residential and commercial uses.                             |
|  | <b>C-2</b> | Small to medium-scale commercial use, typically located along urban corridors. Designed to accommodate pedestrians and, in some instances, the automobile. Mixed-use development is appropriate within this district. |
|  | <b>C-3</b> | Intensive commercial use including key commercial nodes that require additional controls regarding site development, particularly for shopping centers and larger retail establishments.                              |
|  | <b>C-5</b> | Downtown Zoning District. The district is divided into a series of sub-districts that provide design standards to recognize and achieve the different physical characteristics of Downtown.                           |

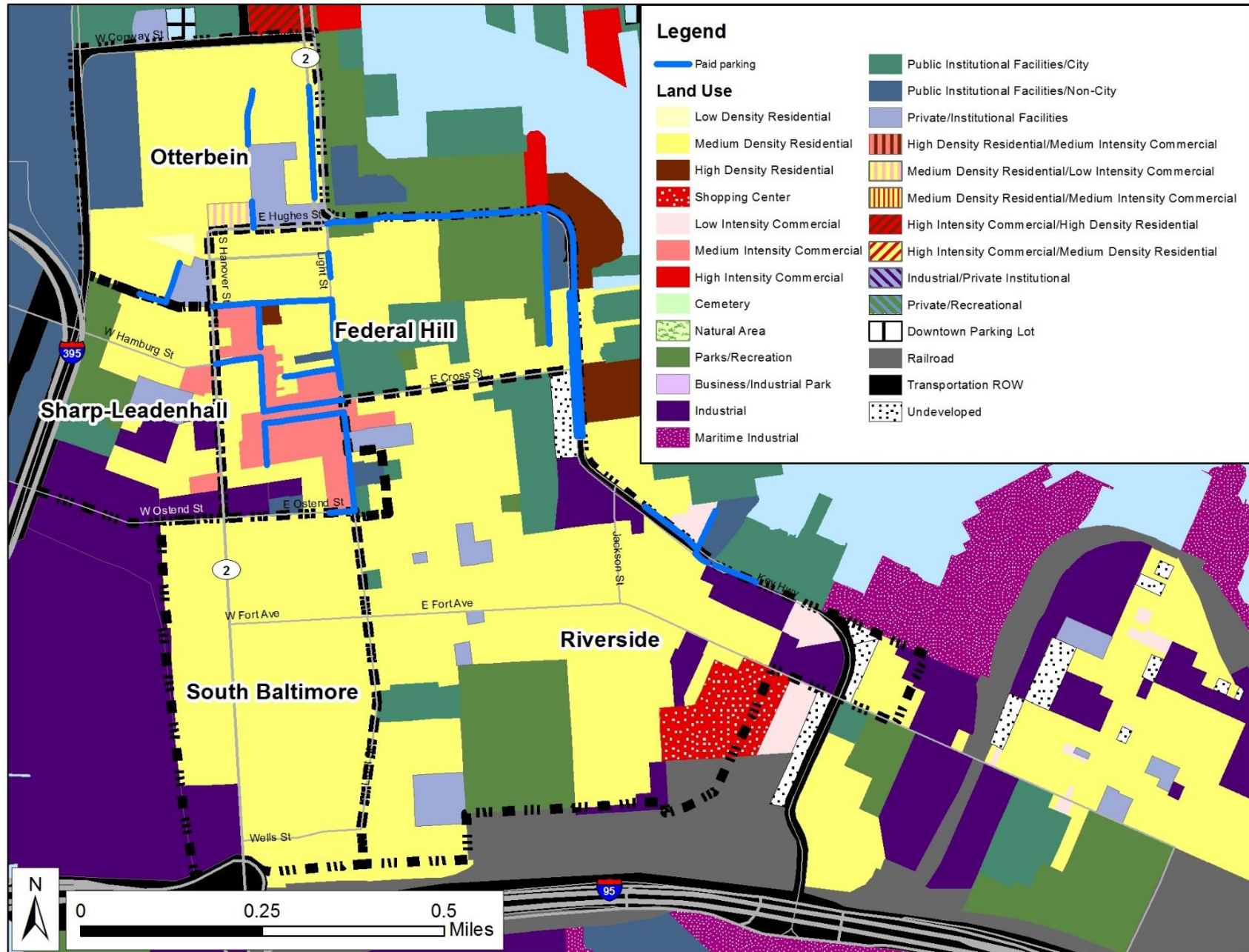
	<b>I-1</b>	Light Industrial Zoning. Light manufacturing, fabricating, processing, wholesale distributing and warehousing uses.
	<b>I-2</b>	General Industrial Zoning. Manufacturing, fabricating, processing, wholesale distributing and warehousing. Commercial uses and open storage allowed.
	<b>I-MU</b>	Industrial Mixed-Use Zoning. Primarily for existing industrial buildings and permits both light industrial uses and a variety of non-industrial uses, such as dwellings, commercial, creating a mixed-use environment.
	<b>OR-1</b>	Office Residential Zoning. A mix of office and residential uses. Areas maintain a residential character. 40' Maximum building height.
	<b>OR-2</b>	Office Residential zoning. A mix of office and residential uses, maintaining a residential character. 100' maximum building height.
	<b>R-7</b>	Mixed Residential Zoning including detached and semi-detached dwellings, rowhouse developments, and multi-family developments of a larger scale. Limited non-residential uses.
	<b>R-8</b>	Traditional form of urban rowhouse. Continuous rowhouse development along full blocks built to or only modestly set back from the street. Also accommodates other residential types of a similar density. Limited non-residential uses.
	<b>TOD-2</b>	Transit Oriented Development - Encourages development conducive to increased transit usage. TOD-2 is employed in areas around existing and anticipated transit stations. Restrictive height/full mix of retail use.
	<b>TOD-4</b>	Transit Oriented Development - Encourages development conducive to increased transit usage. TOD-4 is employed in areas around existing and anticipated transit stations. Significant height/full mix of retail use.
	<b>R-MU</b>	Rowhouse Mixed-Use Overlay District allows a mixed-use rowhouse environment, where some rowhouse structures are used for residential and others for first-floor commercial uses. Tied to base parcel zoning.
	<b>W-1</b>	W-1 Overlay District is intended to preserve, create, and enhance public views of and access to the waterfront by providing a public promenade and preserving public access in non industrious areas. Traditional Hardscape,



## South Baltimore Parking Study

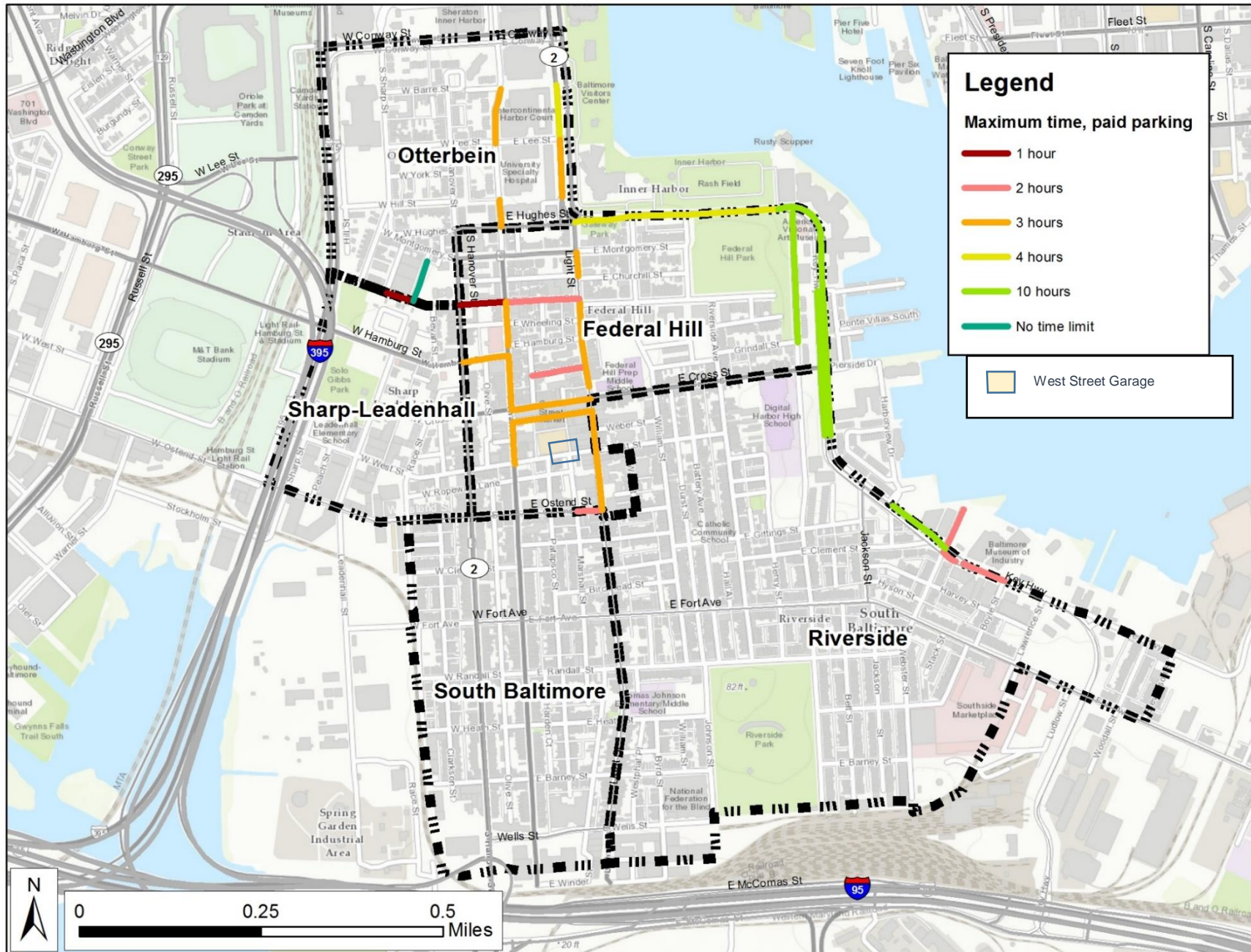


## MAP 2 PAID PARKING LOCATIONS AND ADJACENT LAND USE



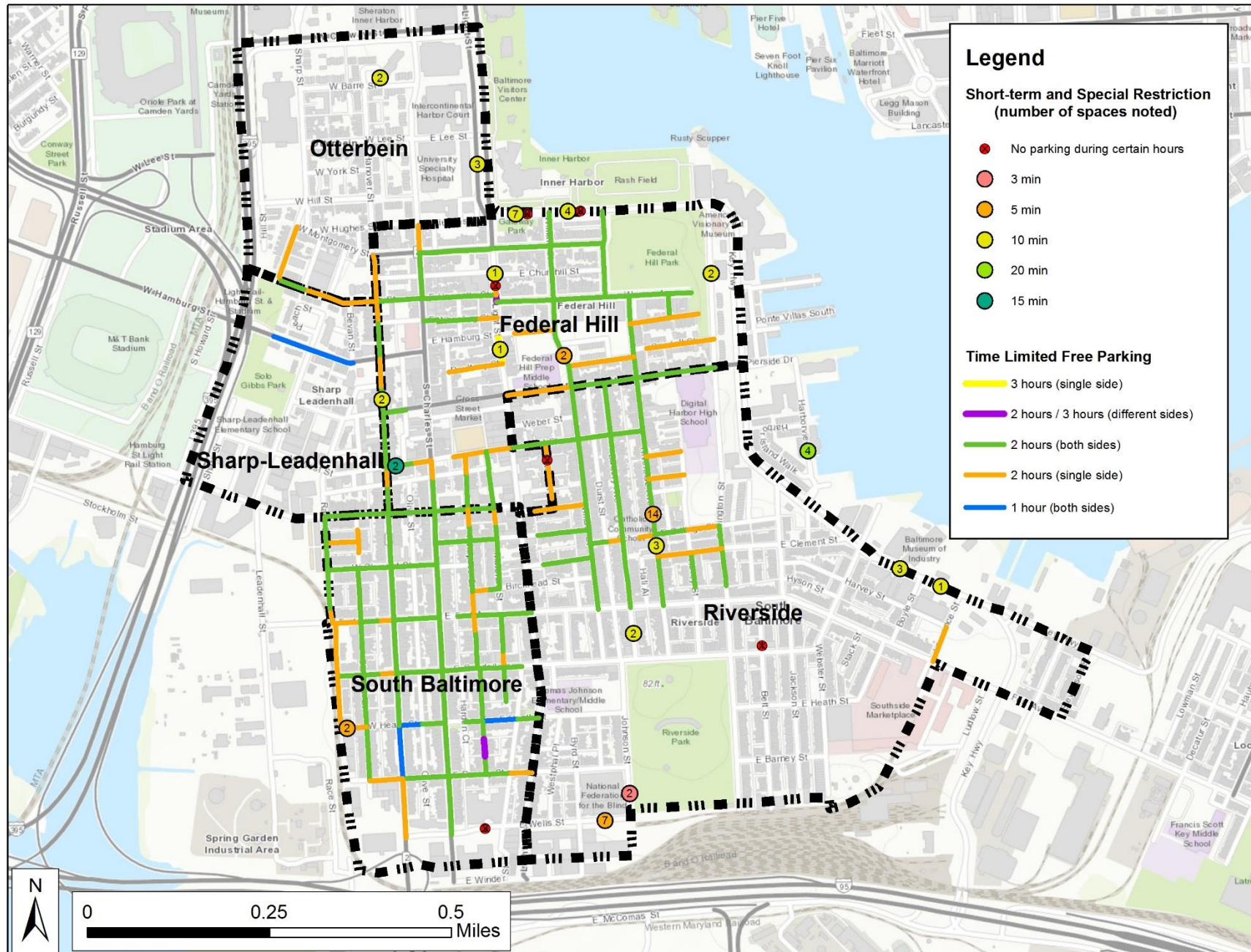


MAP 3 PAID PARKING MAXIMUM TIME



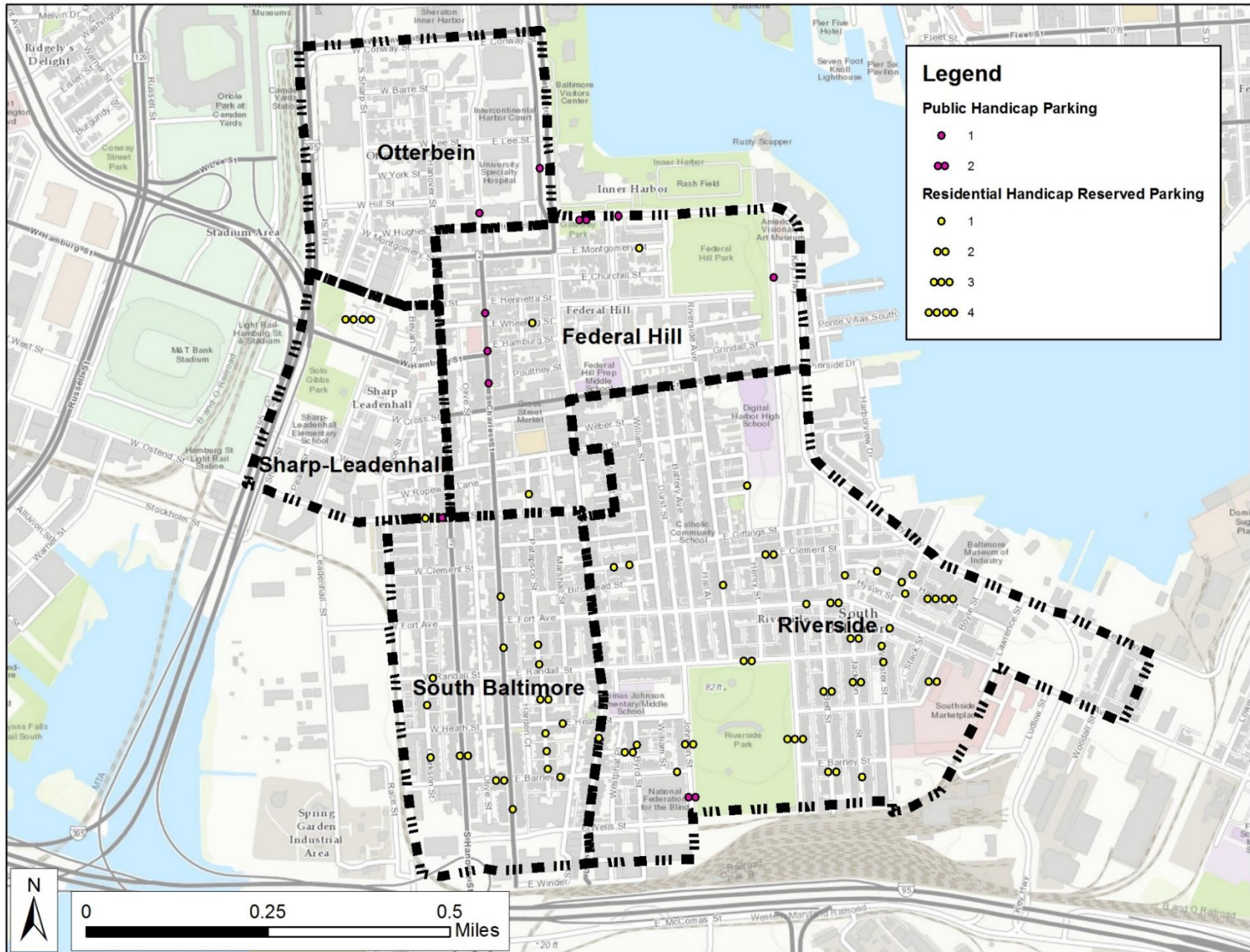


## MAP 4 TIME LIMITED FREE PARKING



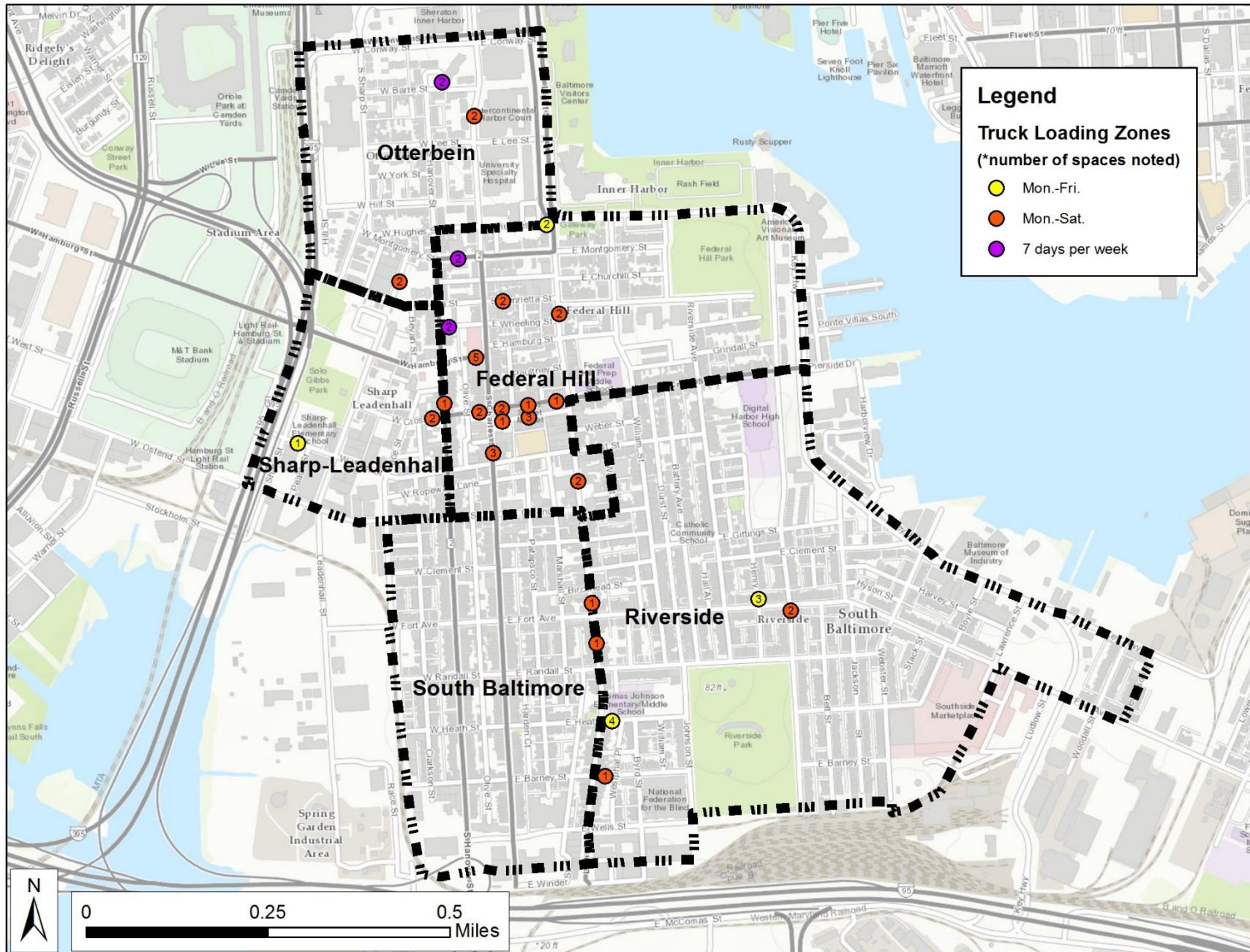


## MAP 5 HANDICAP PARKING





## MAP 6 TRUCK LOADING ZONES



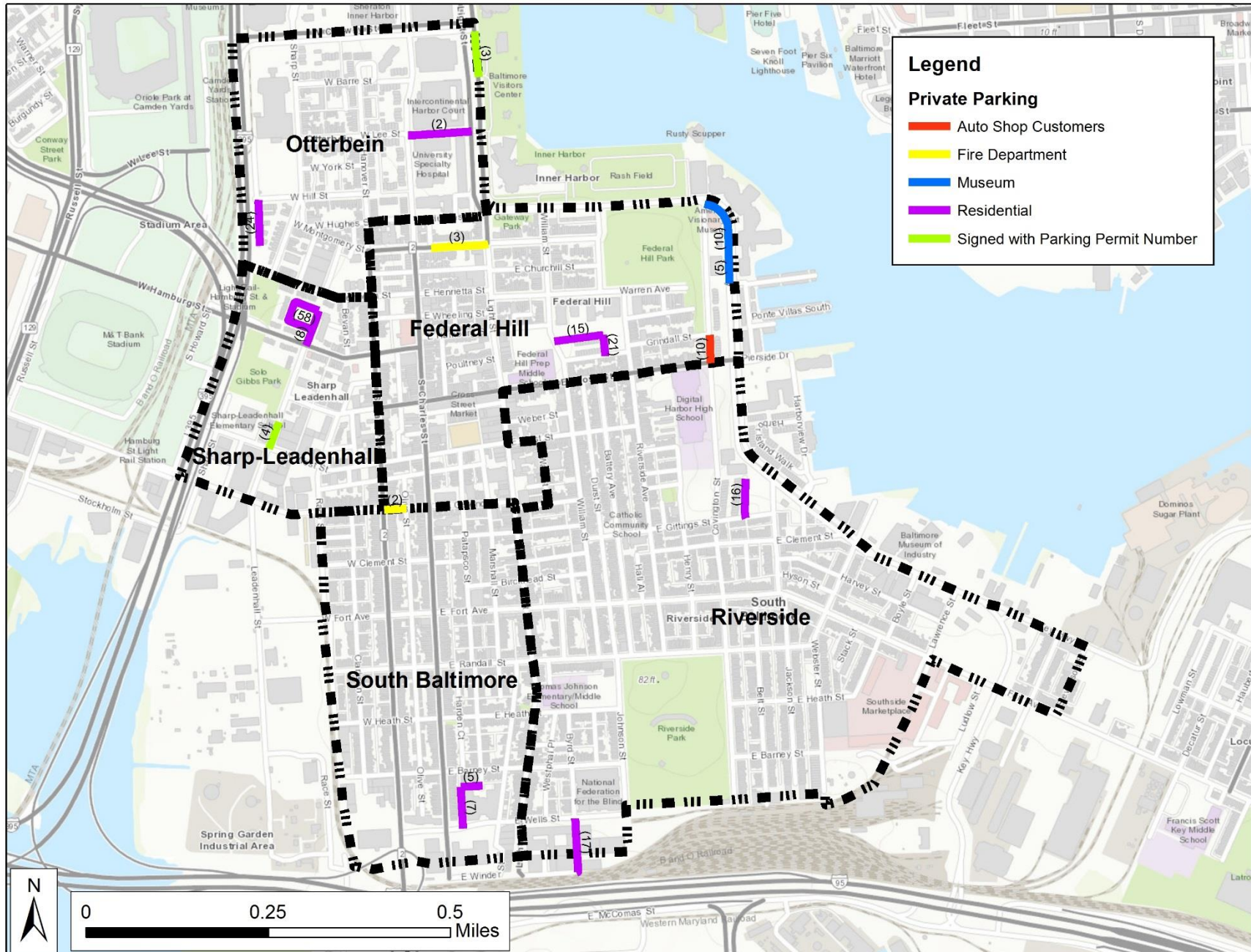


## MAP 7 SPECIAL USE SPACES





## MAP 8 PRIVATE PARKING



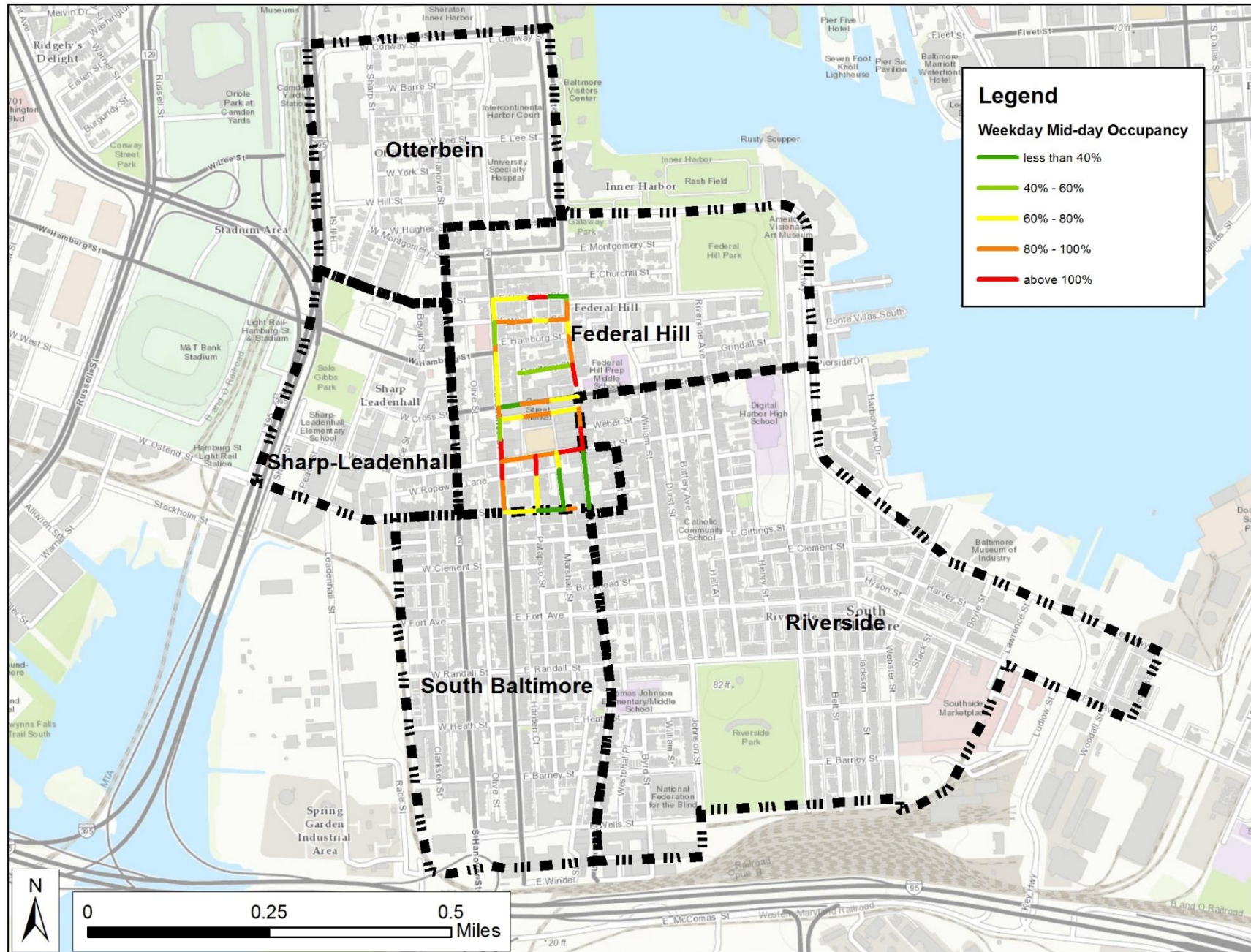


## MAP 9 UNRESTRICTED PARKING



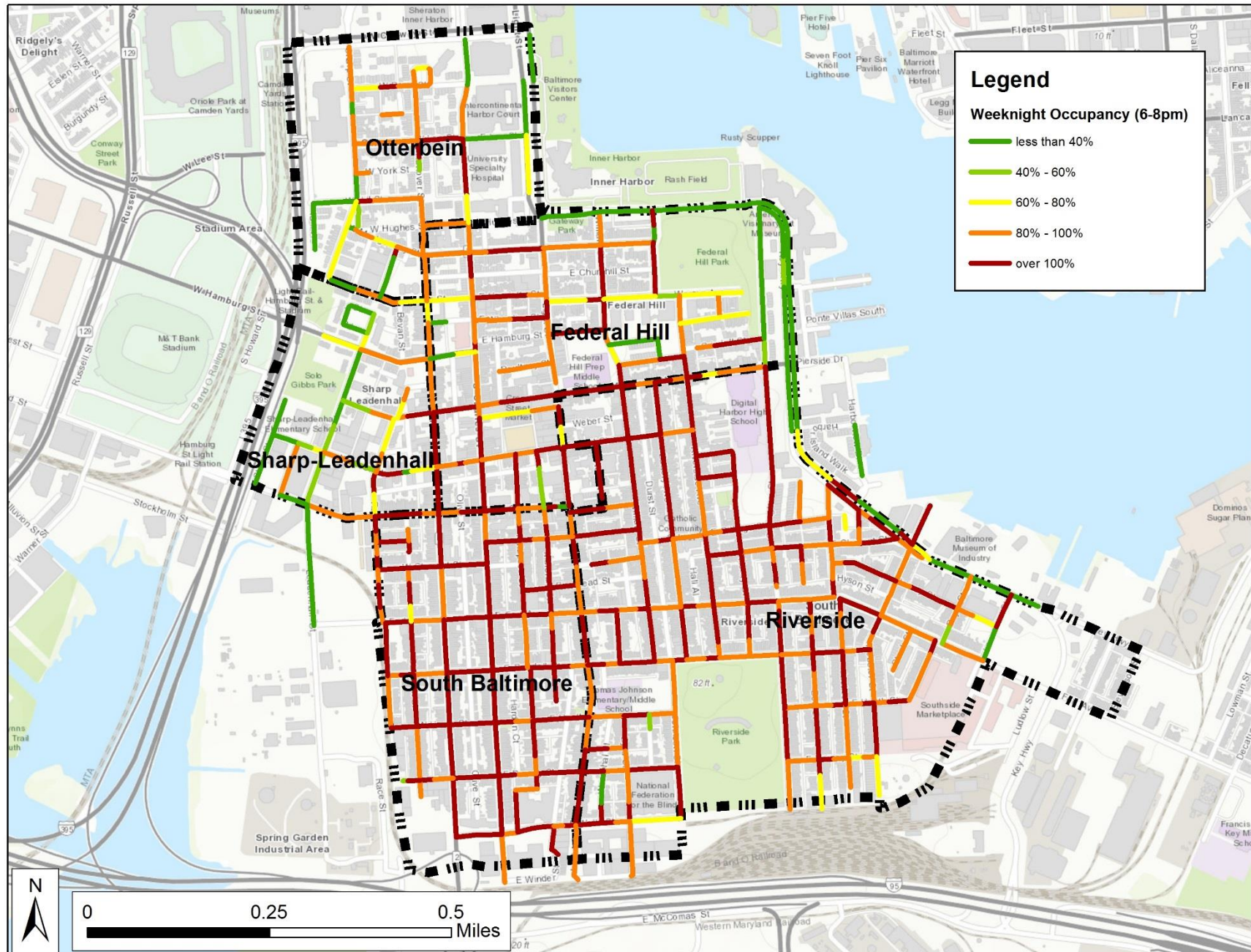


MAP 10 ON-STREET PARKING OCCUPANCY – WEEKDAY MID-DAY



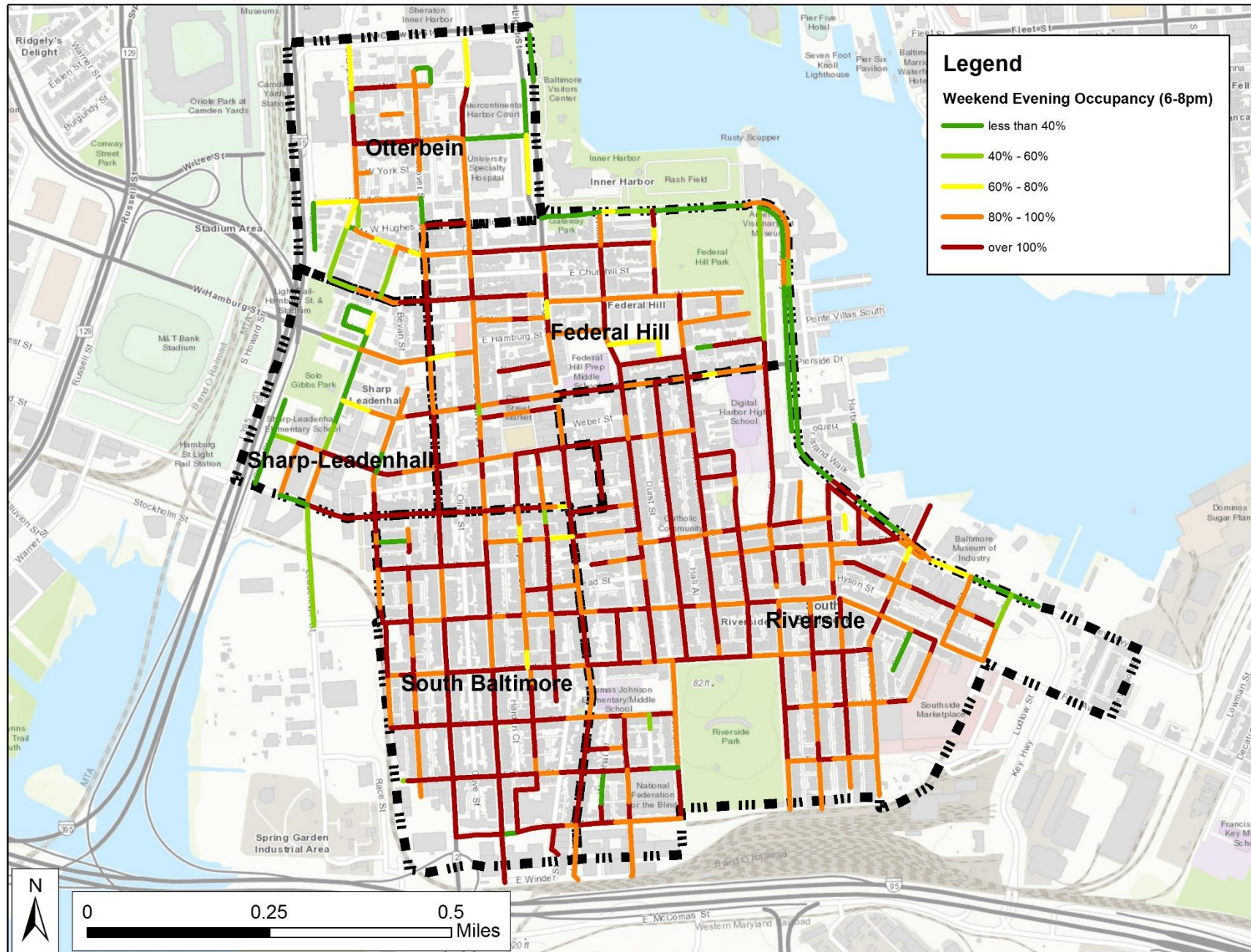


MAP 11 ON-STREET PARKING OCCUPANCY – WEEKDAY EVENING 6:00 PM – 8:00 PM



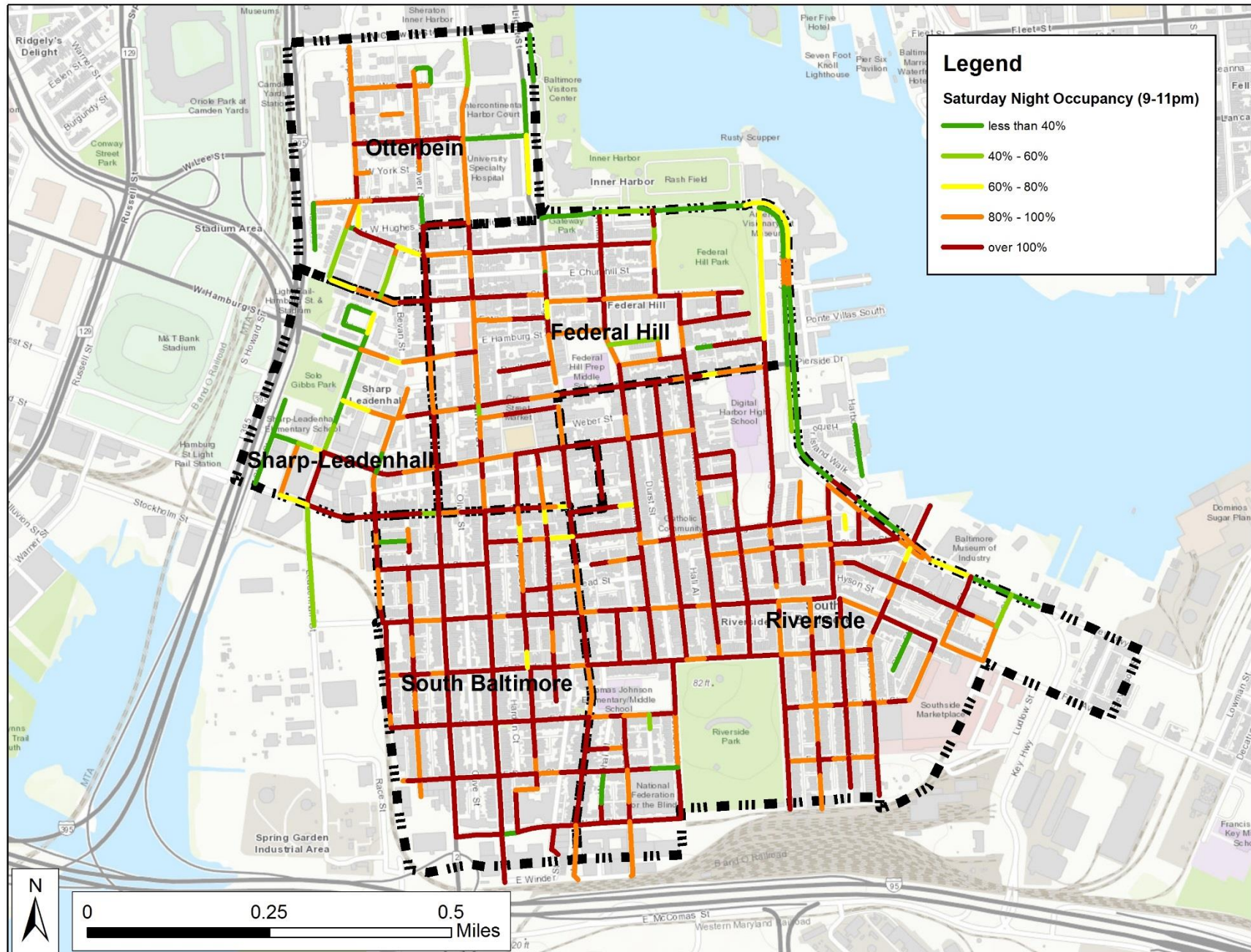


MAP 12 ON-STREET PARKING OCCUPANCY – SATURDAY EVENING 6:00 PM – 8:00 PM





MAP 13 ON-STREET PARKING OCCUPANCY – SATURDAY NIGHT 9:00 PM – 11:00 PM





[illegible]



**Legend**

**Paid Parking Violations (percent of vehicles)**

- less than 25%
- 25 - 50%
- more than 50%

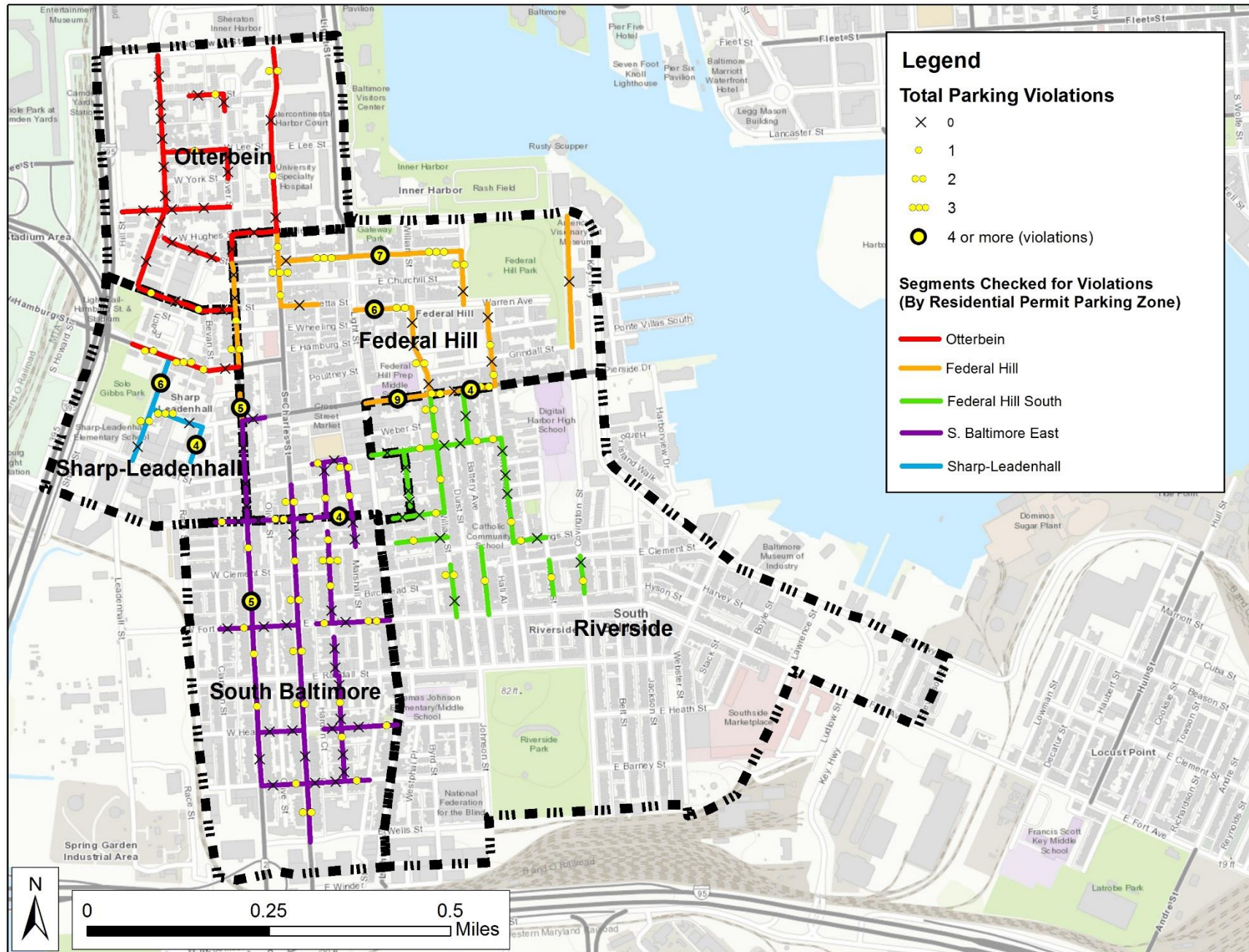
**Neighborhoods:** Otterbein, Federal Hill, Sharp-Leadenhall, South Baltimore, South Riverside

**Scale:** 0, 0.25, 0.5 Miles

**North Arrow:** N

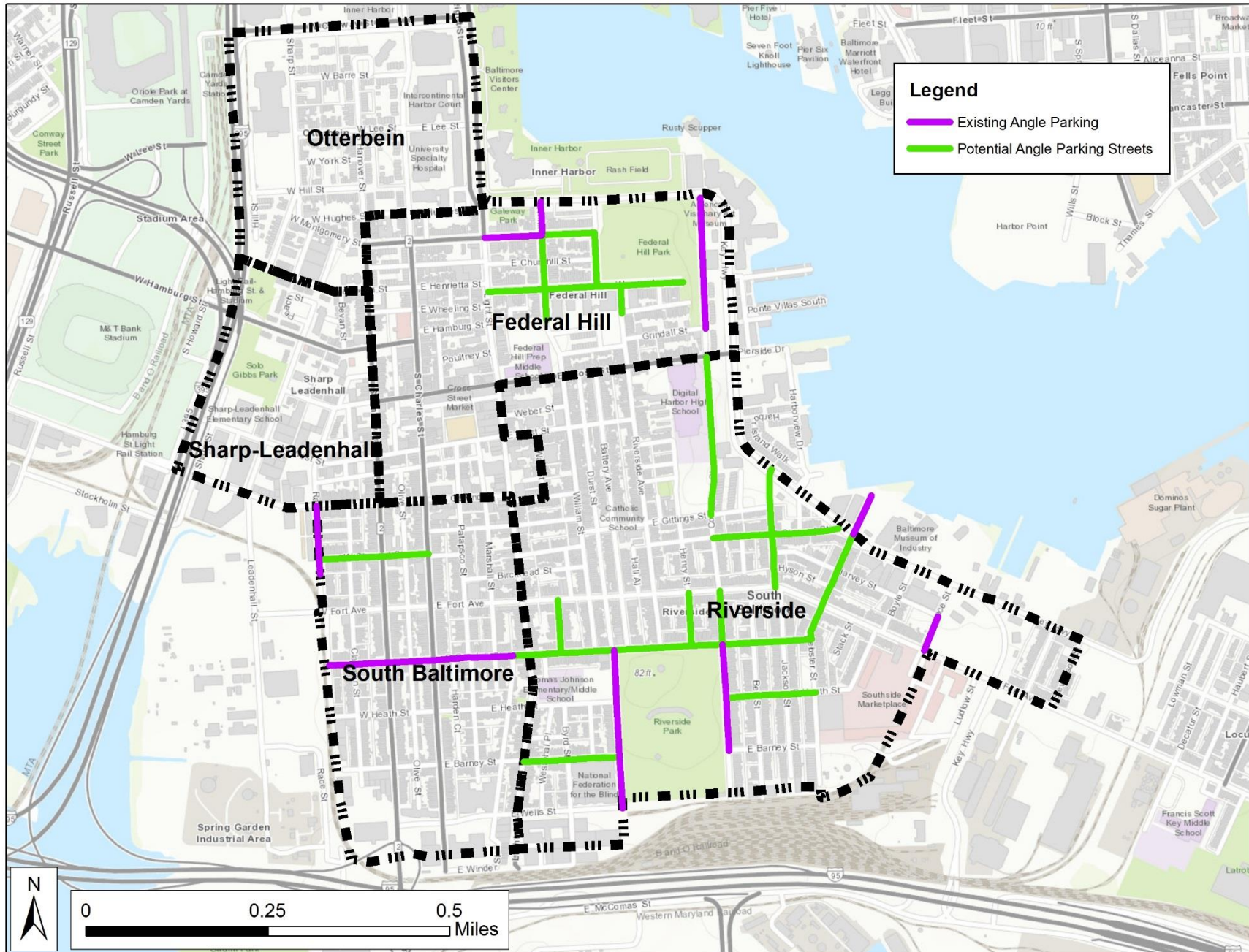


MAP 16 RESIDENTIAL PERMIT PARKING VIOLATIONS – WEEKDAY 1:00 PM – 8:00 PM



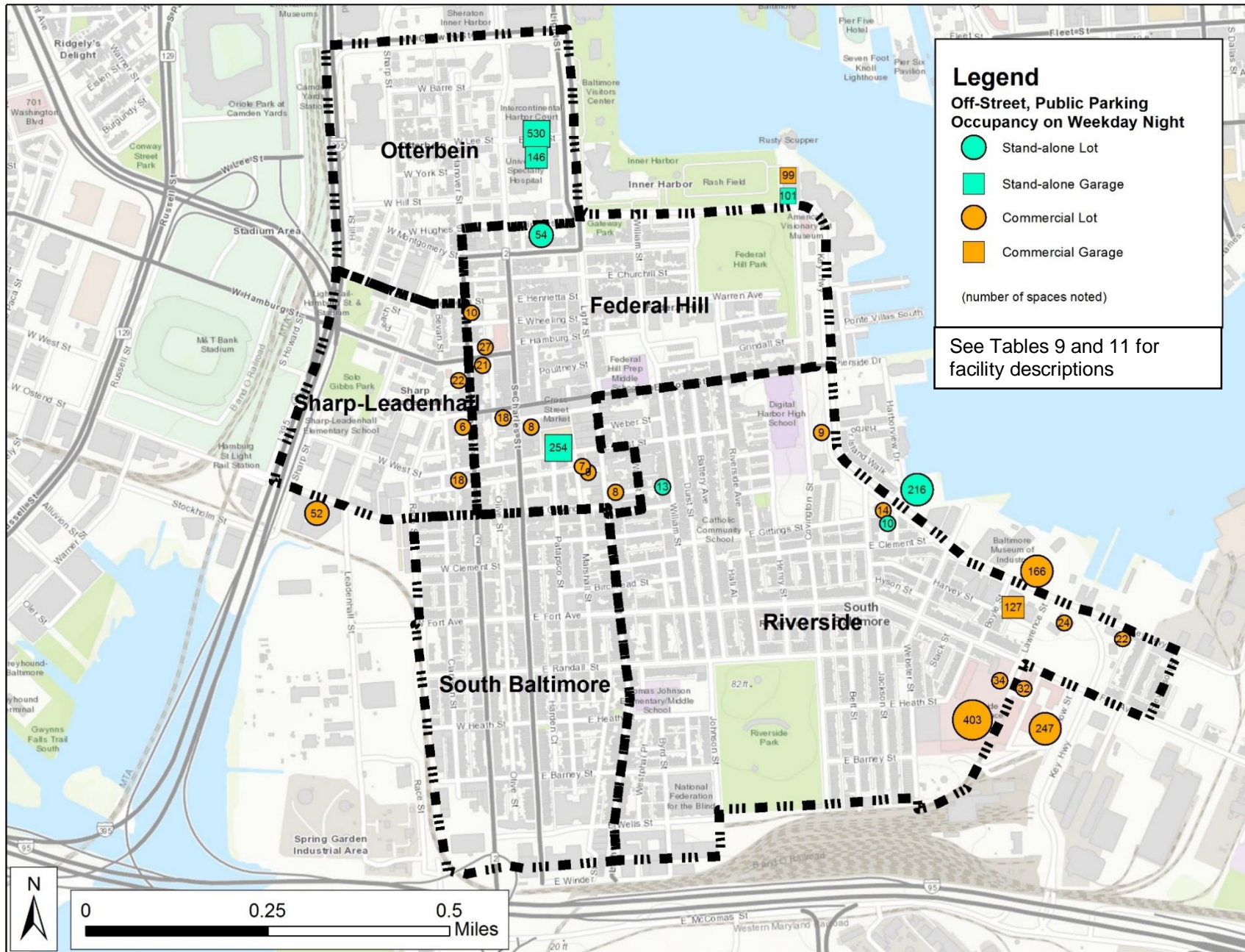


## MAP 17 STREETS TO EXAMINE FOR POTENTIAL ANGLE PARKING



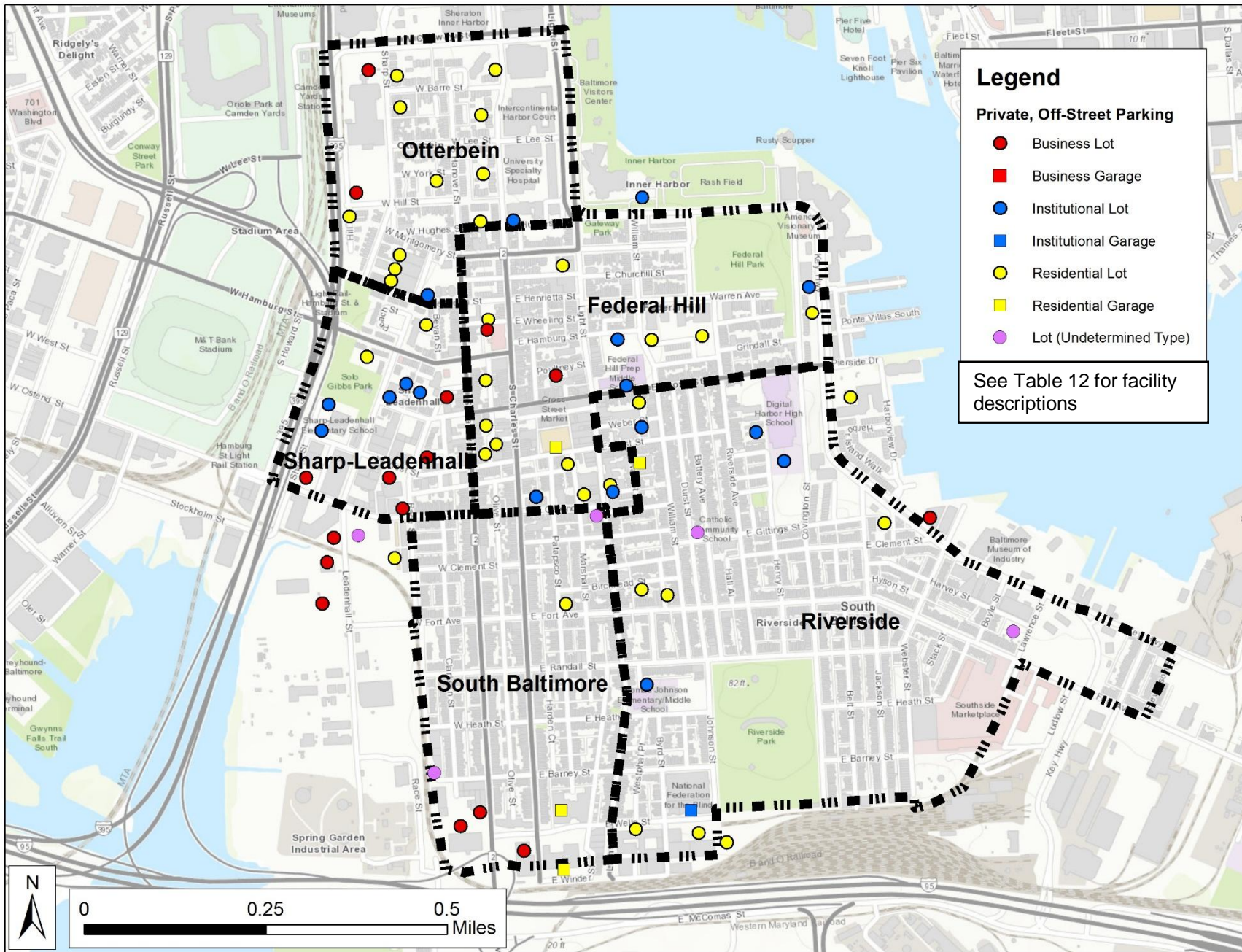


MAP 18 OFF-STREET PUBLIC PARKING FACILITY LOCATIONS AND CAPACITY





## MAP 19 OFF-STREET PRIVATE PARKING FACILITY LOCATIONS





**Whitman, Requardt & Associates, LLP**

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